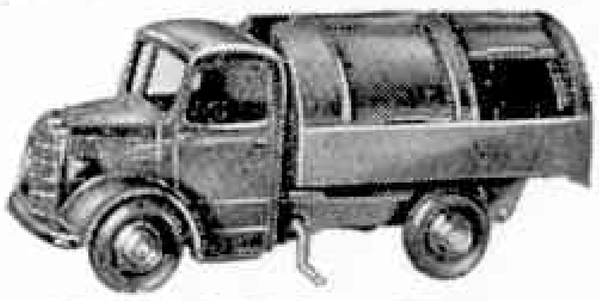
VOL. XXXIV. No. 10 OCTOBER 1949

# MECCANO MAGAZINE

A HIGH LIFT

6D.

# DINKY TOYS



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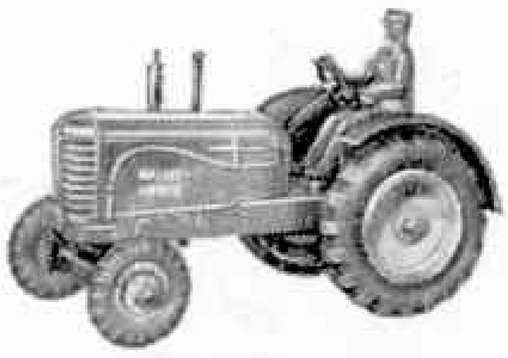

**Massey-Harris Tractor**
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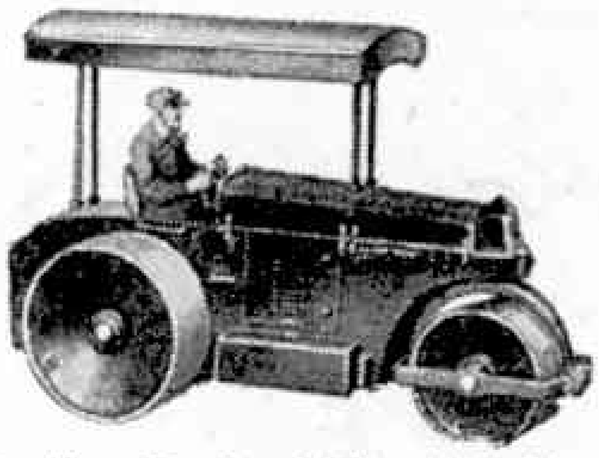

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**No. 25p**
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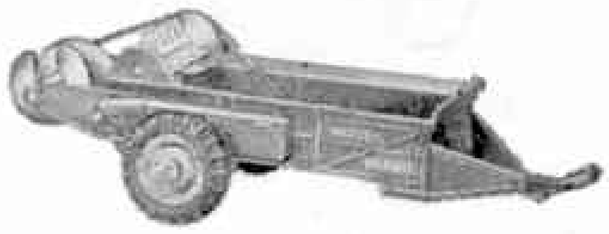
**NEW**



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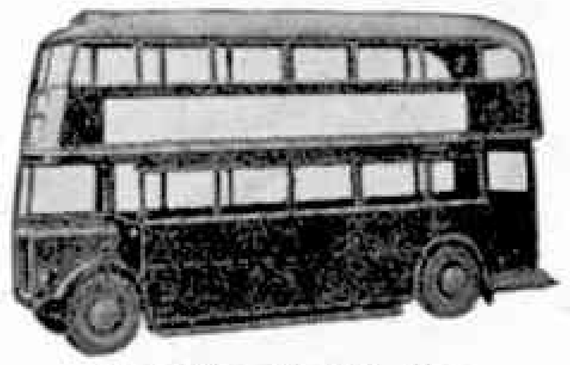

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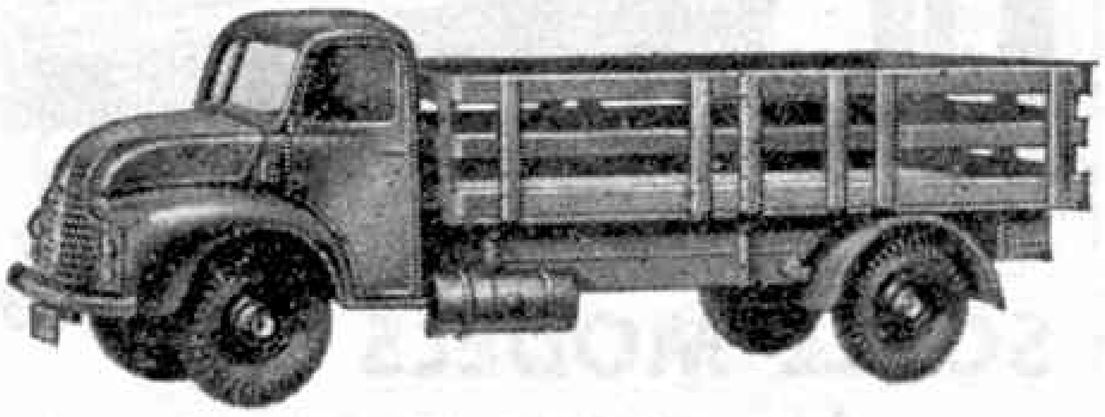

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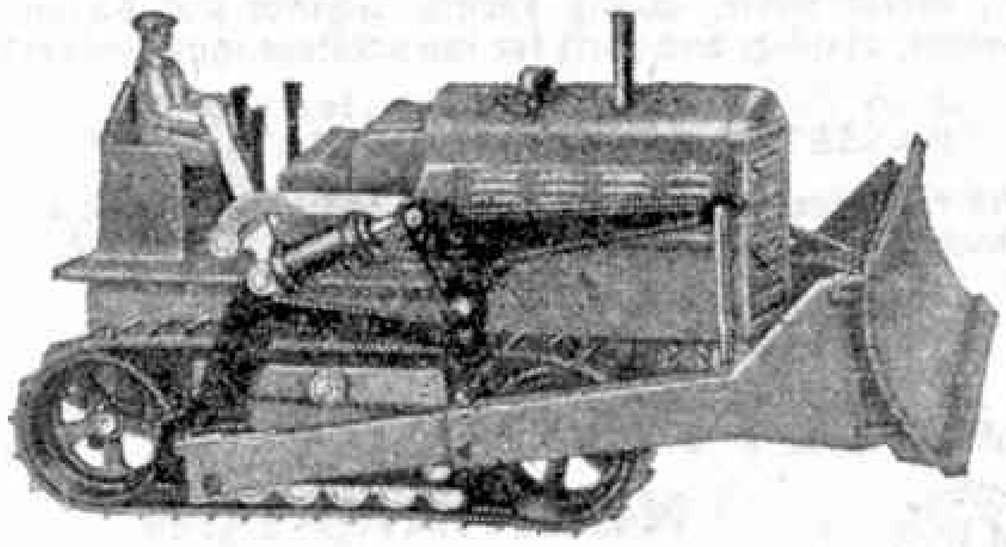

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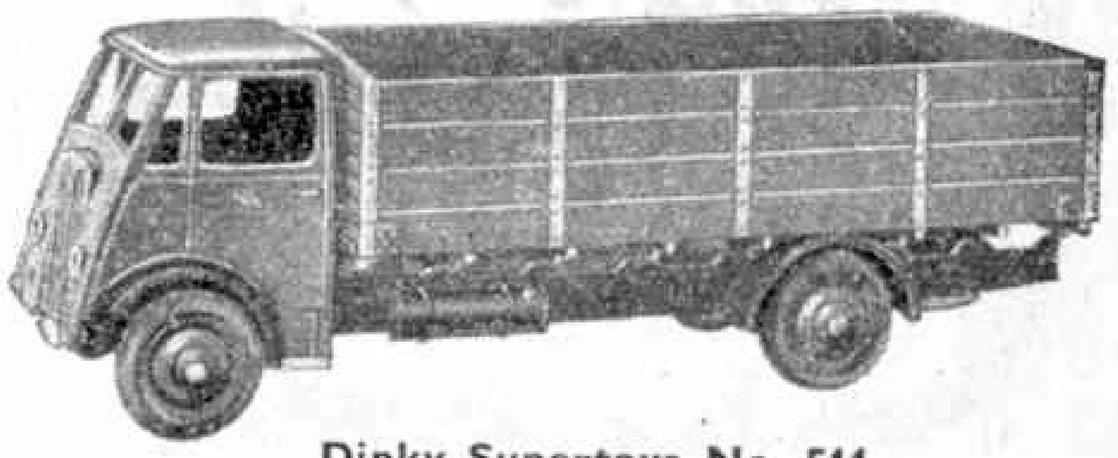

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**Foden 14-ton Tanker**
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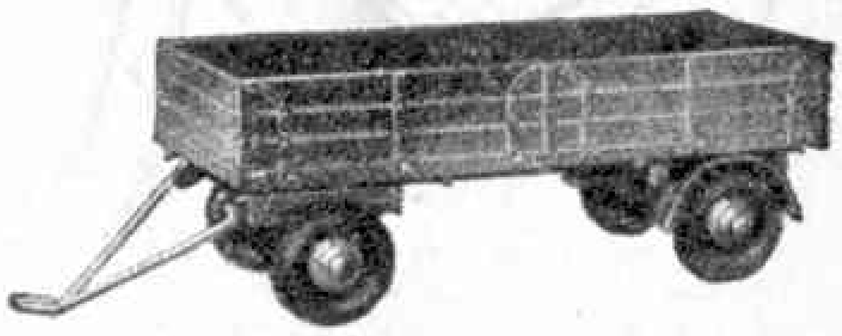

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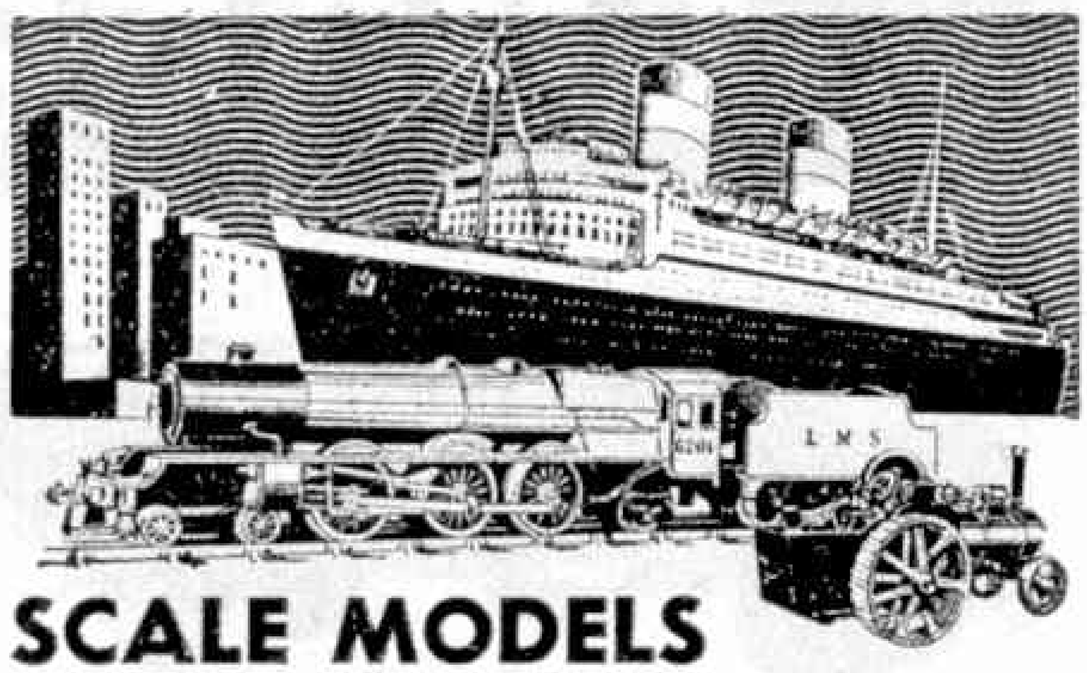

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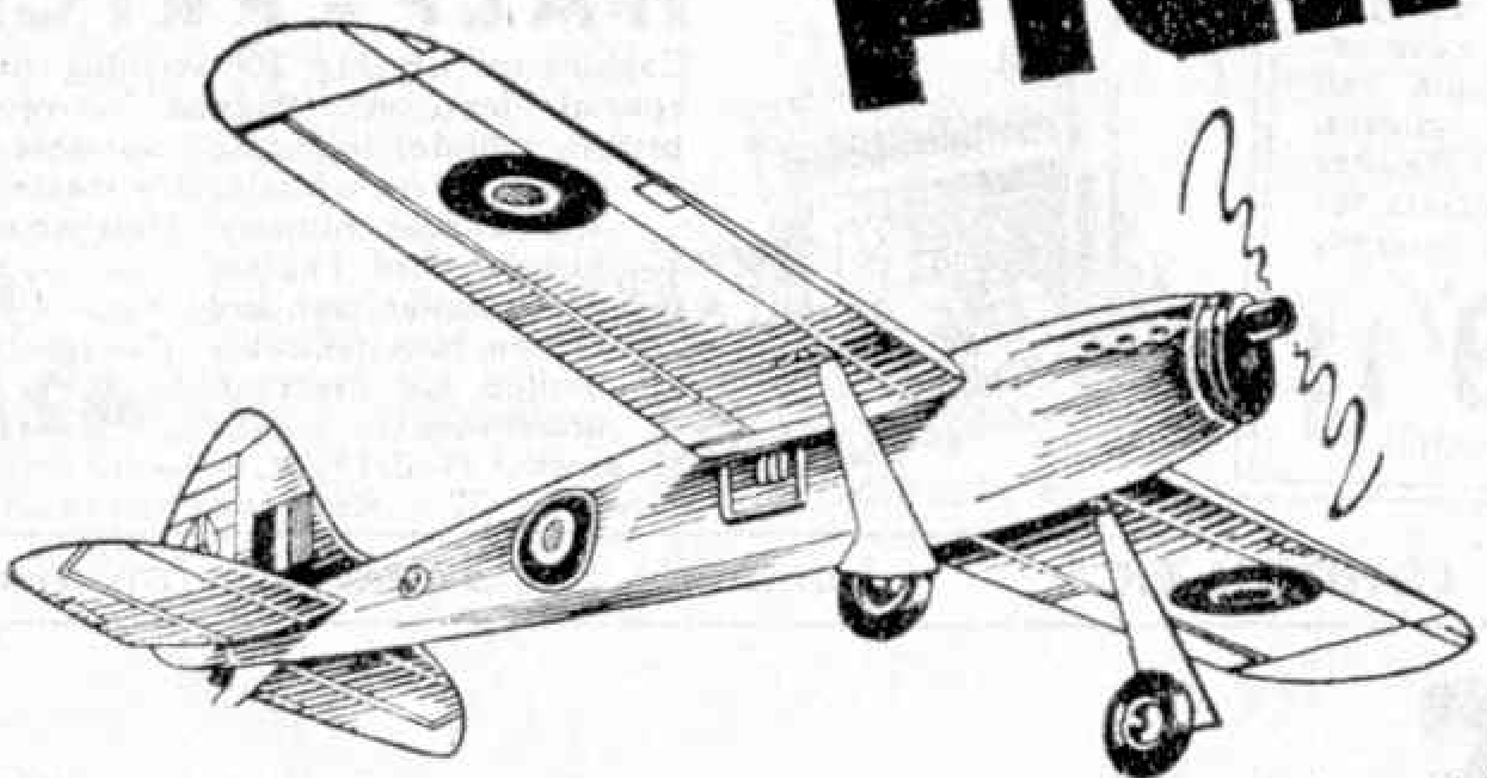

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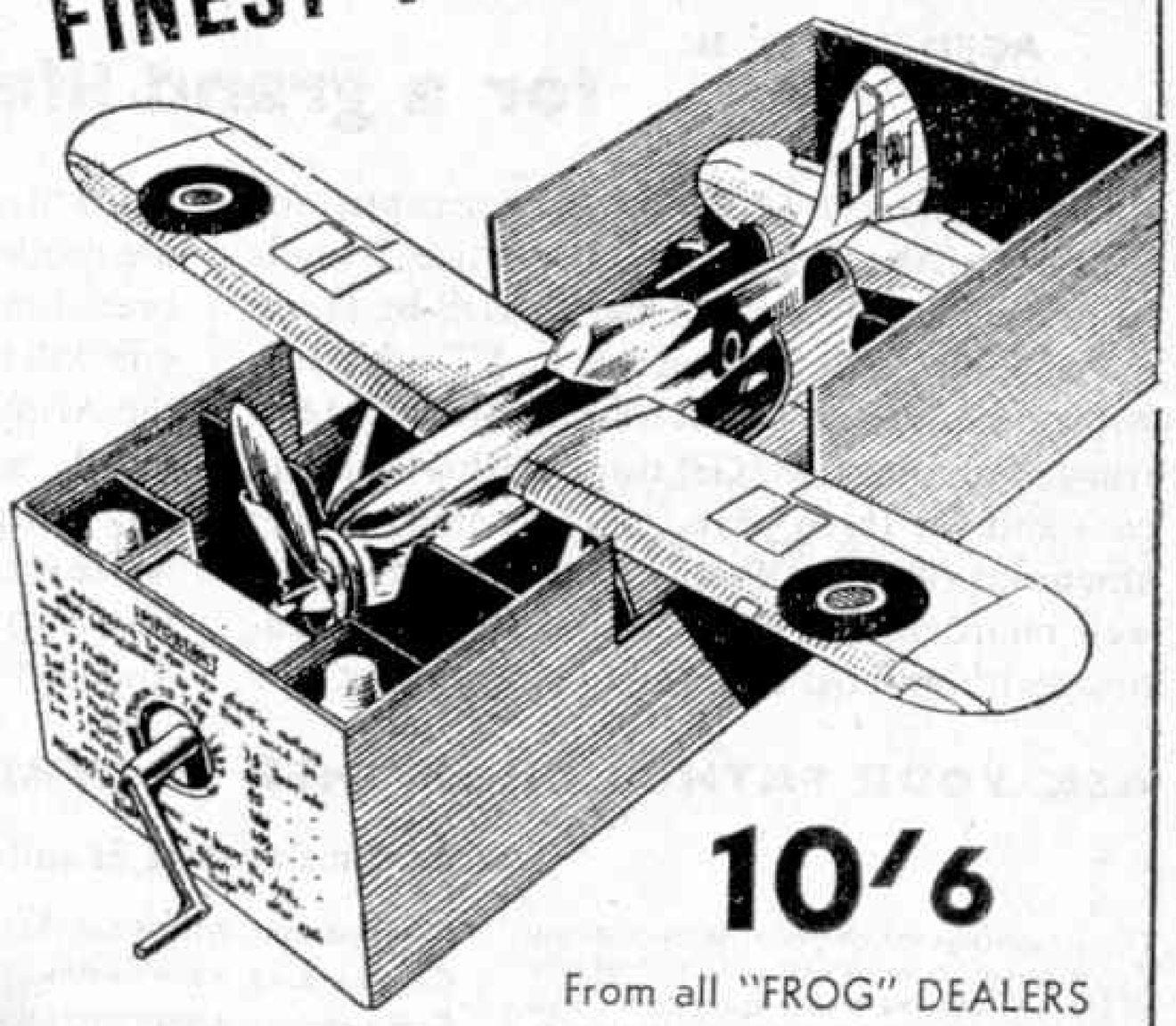

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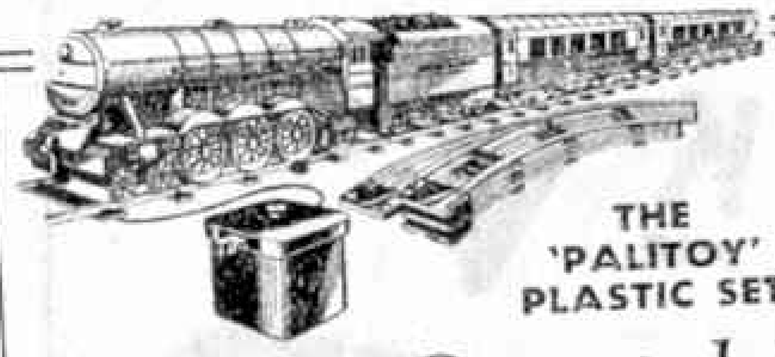

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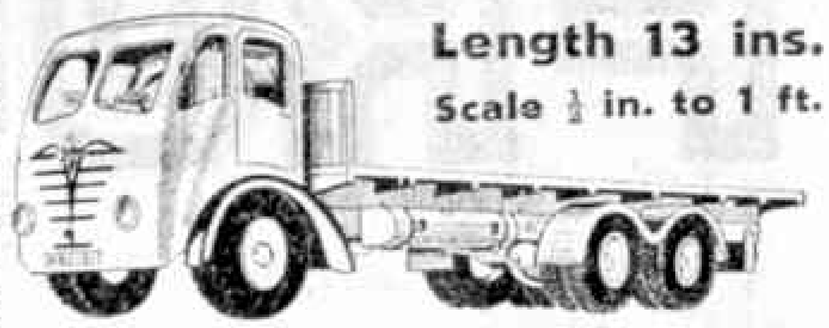

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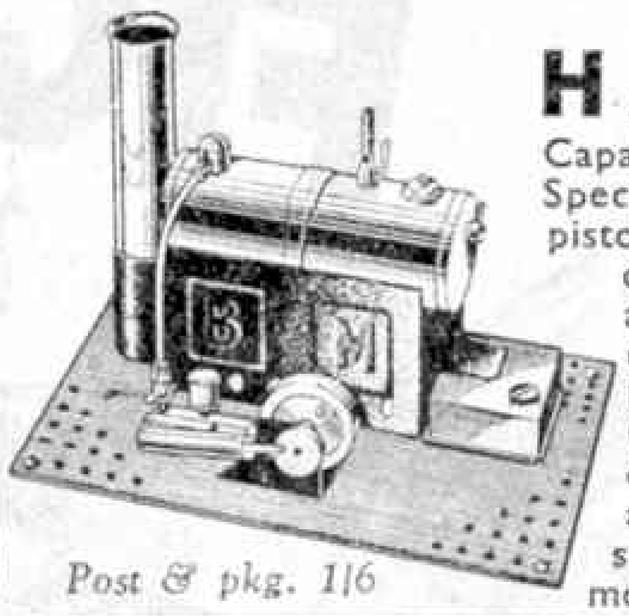

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# MINIC

## SCALE MODELS
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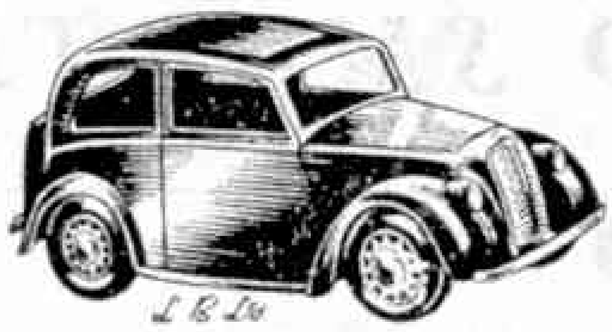
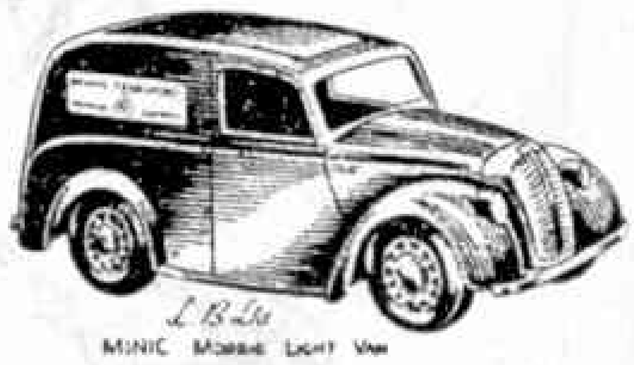
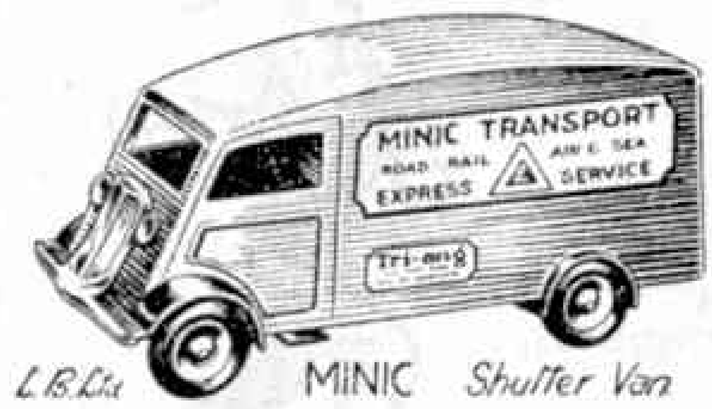



## TRUE REPLICAS OF WELL-KNOWN VEHICLES



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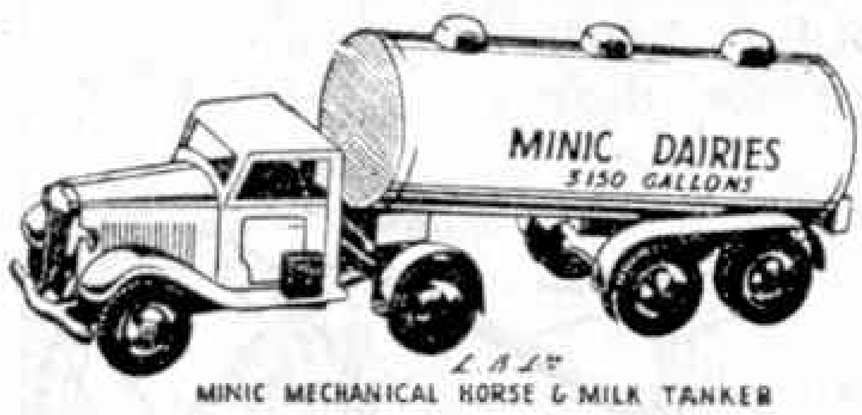
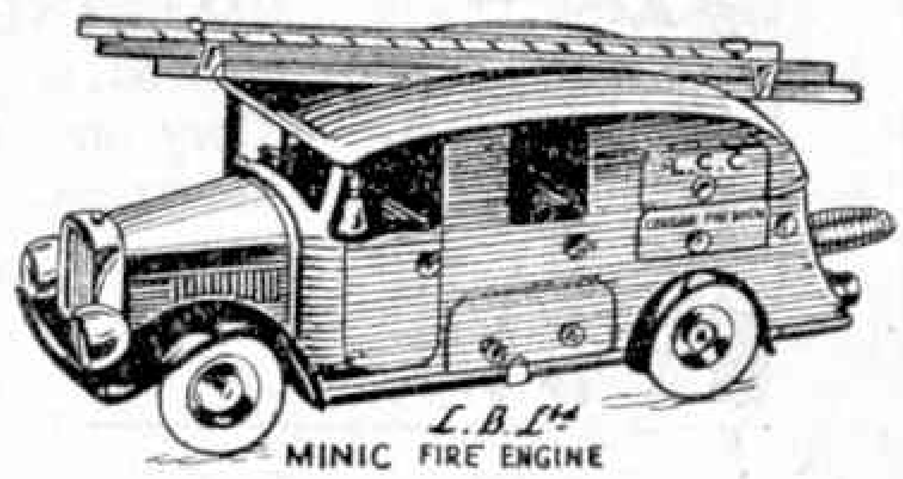
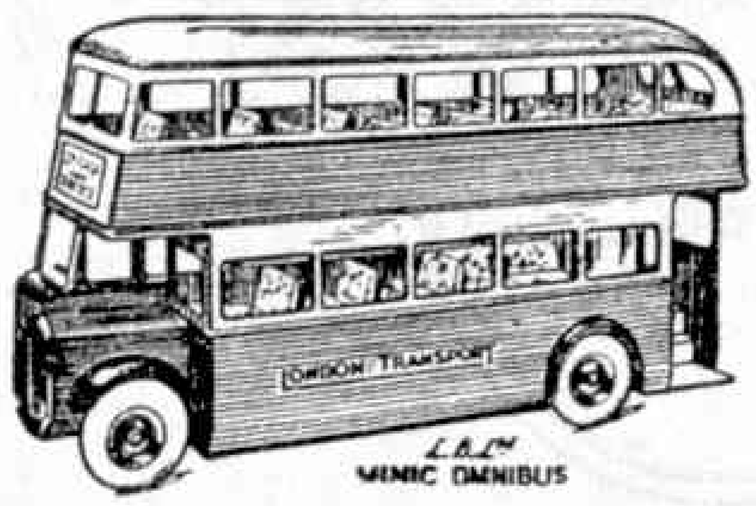
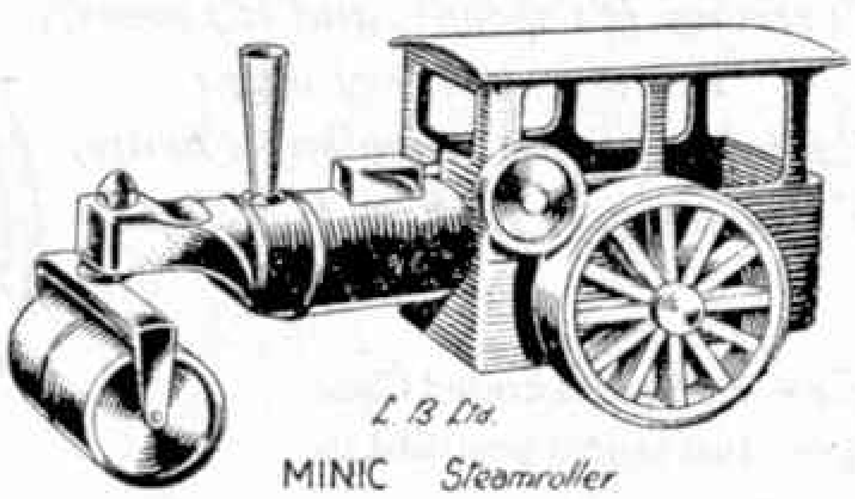



## SPECIALIZED CONSTRUCTION FOR STRENGTH

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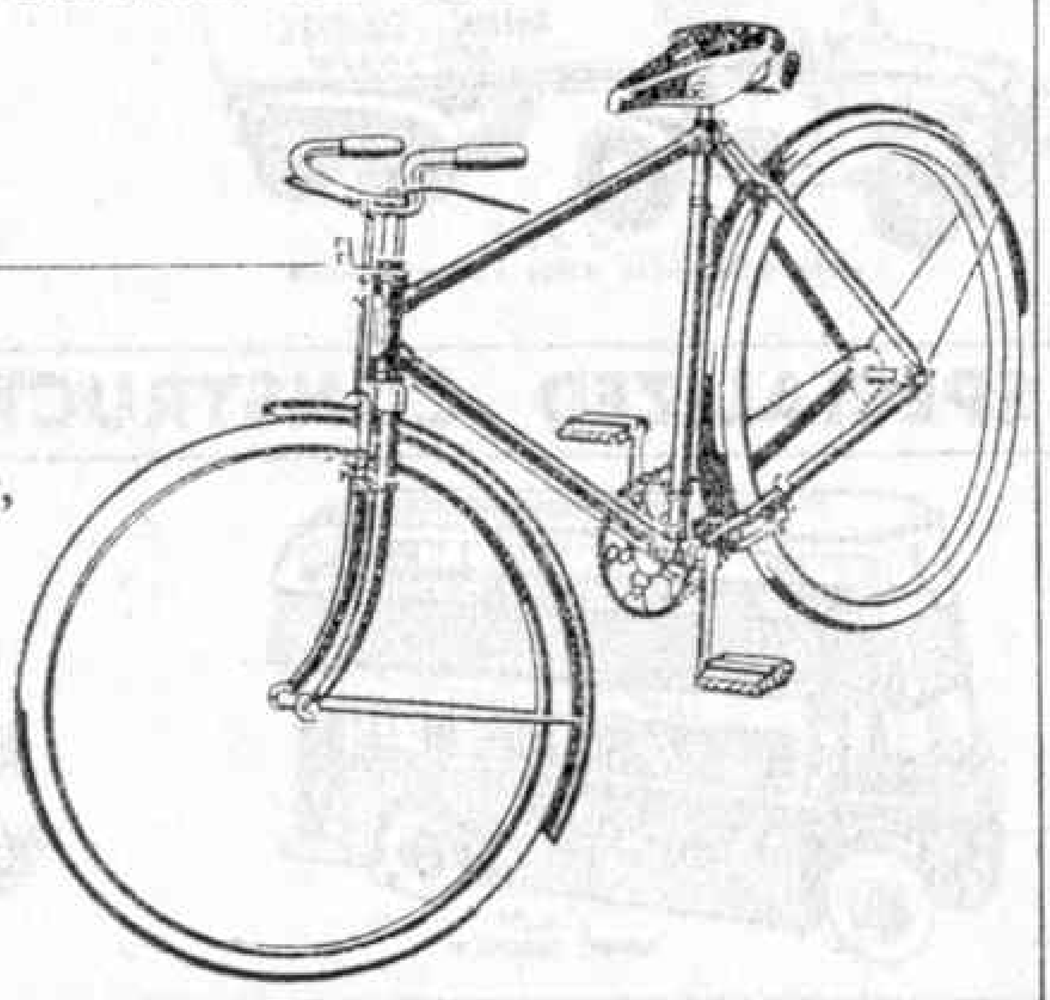

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# MECCANO MAGAZINE

Editorial Office:
Binns Road
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England

Vol. XXXIV
No. 10
October 1949


## With the Editor

### Ice-Cream by the Ton

The article *"Ice-Cream by the Ton,"* by our popular contributor Mr. T. R. Robinson, set me thinking of the tremendous changes that have taken place in the supply of this chilly commodity. My thoughts go back to a time when ice-cream was distributed in our towns by wooden vehicles of various sizes, all conspicuous by their hideous livery of red and yellow paint. The ice-cream was contained in a wooden tub carried in the middle of the vehicle, and ladled out as required by means of a big wooden spoon wielded by a not always clean hand. Much of it was made in small houses in dingy back streets in places where cleanliness and sanitation were definitely absent. All this has gone. The contrast between such ice-cream "factories" and the one described by Mr. Robinson is difficult to realise.

The quantity of ice-cream eaten to-day must be enormous. A recent visit to a famous Lancashire holiday resort gave me the impression that at least half of the vast happy throng on the promenade, from toddlers to grown-ups of all ages, were actively engaged with ice-cream cornets. Whether it is good for their insides I do not know, but they certainly enjoy it hugely.

And, on the quiet, so do I.

### Locomotive Footplate Trips

Probably the dearest wish of many of my readers is to make a trip on the footplate of a locomotive. Unfortunately the privilege of riding the engine can only be granted in special circumstances, and most of us have to be content with reading accounts of such runs. I have published many of these accounts in the *"M.M."* from time to time, and they have always been greeted with general approval. Most of them have dealt with trips in the British Isles, but there have also been some stories of journeys in Canada and the United States. In this issue appears another account entitled *"On the Footplate in Palestine,"* which breaks new ground. The unusual conditions, or even hazards at the time of the journey, an all-day jog-trot beginning at 5.30 in the morning, much of it across the desert, make the description an outstanding one that I am sure all readers will enjoy.

I have in preparation another good footplate story that will appear in an early issue. This deals with a night run on a Norwegian locomotive, and provides a great contrast to the Palestine trip.

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# The Smith Mobile Excavator Crane

## Powerful Machine with Many Uses

OUR cover this month shows a remarkable mobile crane at work during the erection of one of the large cranes used in docks for loading and unloading ships. The mobile crane itself is mounted on a lorry chassis, so that it is capable of travelling at the rate of 20 m.p.h. or even more, and it is ready for work immediately it reaches the end of its journey to the place where it is to be used. The jib is built in six sections, so that lengths of 30 ft., 45 ft., 60 ft., 75 ft. or 90 ft. can be employed, to suit the immediate requirements of the task allotted, and with the 30 ft. jib a load of 12 tons can be hoisted at a radius of 10 ft.

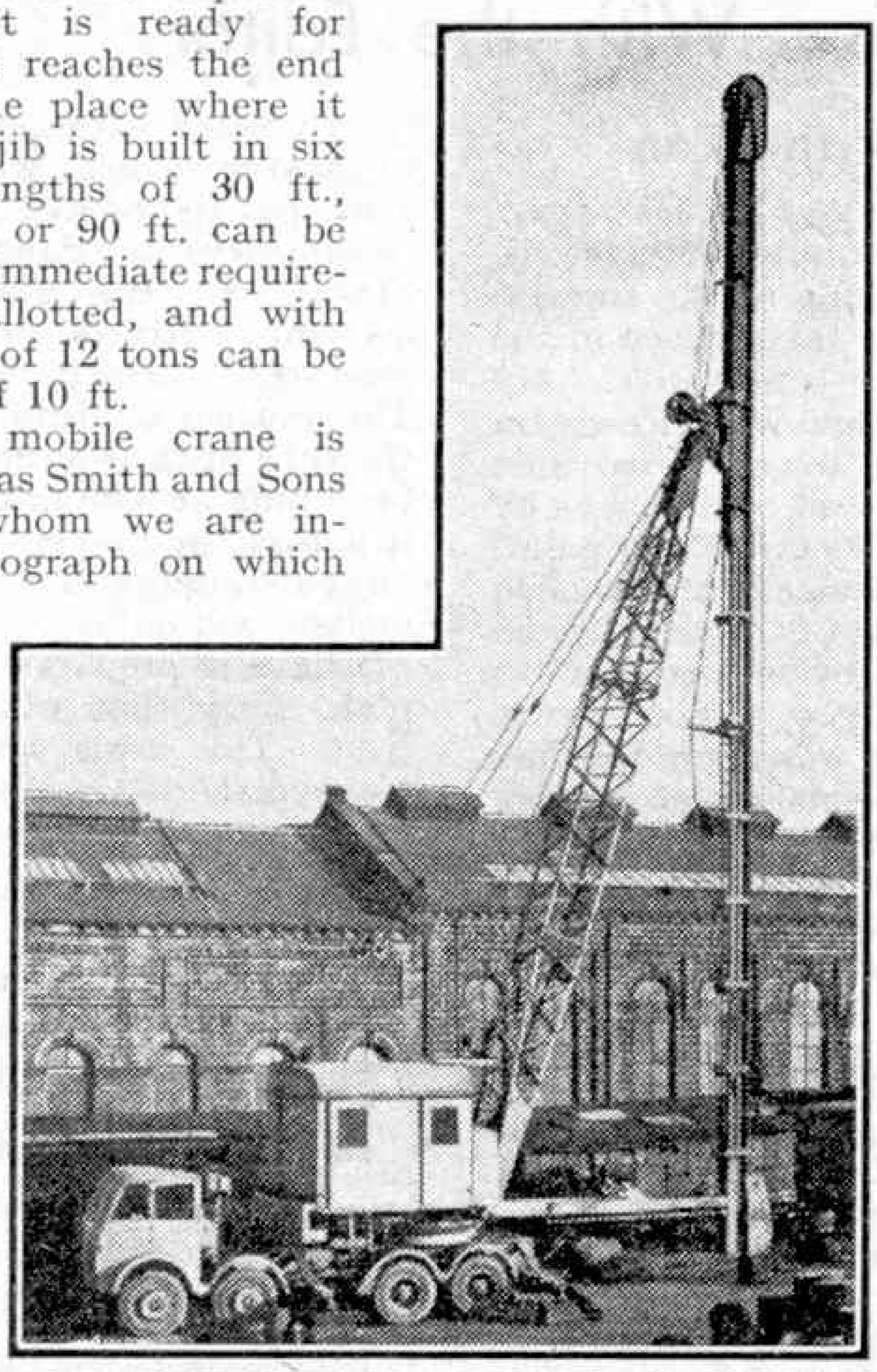
This remarkable mobile crane is constructed by Thomas Smith and Sons (Rodley) Ltd., to whom we are indebted for the photograph on which our cover is based. It is known as the Smith 12-ton Mobile Excavator Crane, as the revolving crane portion is chiefly made up from the excavator design of the firm.

The first cranes of this type used the Foden eight wheel chassis. An E.R.F. also was used, and further cranes are being built using the Leyland six-wheel chassis. All the chassis employed use standard components, with a special heavy frame built into them. The frame incorporates the turret on which the crane portion rotates, and also embodies the draw beams which are extended for lifting heavier loads.

The crane portion is a fully revolving structure that rotates on a live ring of tapered rollers and is connected to the chassis by a centre spigot and three hook rollers. It has a separate engine, a plan that gives a longer engine life and avoids the transmission complications that would be encountered if the lorry engine were required to provide power for hoisting and other crane movements.

The engine of the Foden mounted cranes is a Fowler 5B 55 b.h.p. diesel unit. That of the cranes on Leyland chassis is a Leyland six-cylinder unit. All are provided with a hydraulic coupling instead of a plate clutch for transmitting power. Interlocked hand and foot levers are provided for the engine throttle, giving well graduated control of engine speed in order to vary the rate of hoisting, slewing or derricking as required. Hoisting and lowering of loads is attained by means of a toggle clutch and the engine hydraulic coupling. Power for slewing is smoothly transmitted through flat plate friction clutches, which are also used for speedy derricking of the load.

For road travel purposes the jib is 30 ft. long, and it is slung over the cab of the lorry on which the crane is mounted, as shown in the upper illustration on the opposite page. The units that can be added to extend the jib are each 15 ft. in length, providing altogether five different lengths of jib, with loads varying from the 12 tons of the 30 ft. jib at a radius of 10 ft., to the 3½ tons of the 90 ft. jib, a load that can be lifted at a maximum radius of 25 ft. Hoist blocks with a mechanical advantage of four to one are used for



**A Smith Mobile Excavator Crane fitted with pile driving equipment used in constructional work and civil engineering projects. The illustrations to this article are reproduced by courtesy of Thomas Smith and Sons (Rodley) Ltd.**

The Smith M.E. Crane ready for the road, with its tubular steel jib in travelling position.

the heavier loads and those for lighter loads have an advantage of two to one. The derrick ropes lead to pulleys carried on a special frame at the extreme rear of the machine in order to keep stresses in the jib and in the ties as low as possible.

For dealing with the heaviest loads, up to 12 tons, jacking beams are provided, These are carried in boxes and are withdrawn by hand to give a base width of 13 ft. Screw jacks are fitted at their ends to clamp down on blocks. Without the use of the jacking beams, that is with the lorry resting freely on its tyres, a load of four tons at a radius of 10 ft. can be lifted on the 30 ft. jib.

The original jib was made up of high tensile steel angles, but owing to the lack of this material a tubular steel jib has been developed. This is of less weight and greater strength than the high tensile steel jib, and has proved so successful that there will be no return to the latter. The main tubes of the new type of jib have an outside diameter of $4\frac{1}{2}$ in., with bracing of $1\frac{3}{8}$ in. diameter; and its weight of $2\frac{1}{2}$ tons is half a ton less than that of the high tensile steel jib it has replaced. A feature of the new tubular jib is that the sections are joined by means of steel pins, which provide a very rapid and convenient method of assembly. Accuracy of manufacture is ensured by means of jigs.

The machine is primarily intended for crane duties, but it will take all the usual digging equipments, so that it can be used as a navvy shovel, a dragline, a skimmer scoop, a drag shovel or a grab. One particularly interesting application is in pile driving. For this purpose the special attachment shown in the illustration on the opposite page has been designed to the order of John Mowlem and Co. Ltd., one of the contracting firms making use of the Smith Mobile Excavator Crane. This equipment can handle piles up to 90 ft. in length, and provides racking in the full circle. The leader is made up in sections and is swivel mounted at the jib end. A brake band is fitted around the circular crane turret to prevent rotation of the crane. The same firm has made excellent use of another Smith Mobile Excavator Crane as a dragline, using the 75 ft. jib and a bucket with a capacity of half a cubic yard.

A Smith M.E. Crane fitted with short jib helping in the erection of prefabricated houses.

# The Development of Aeronautics

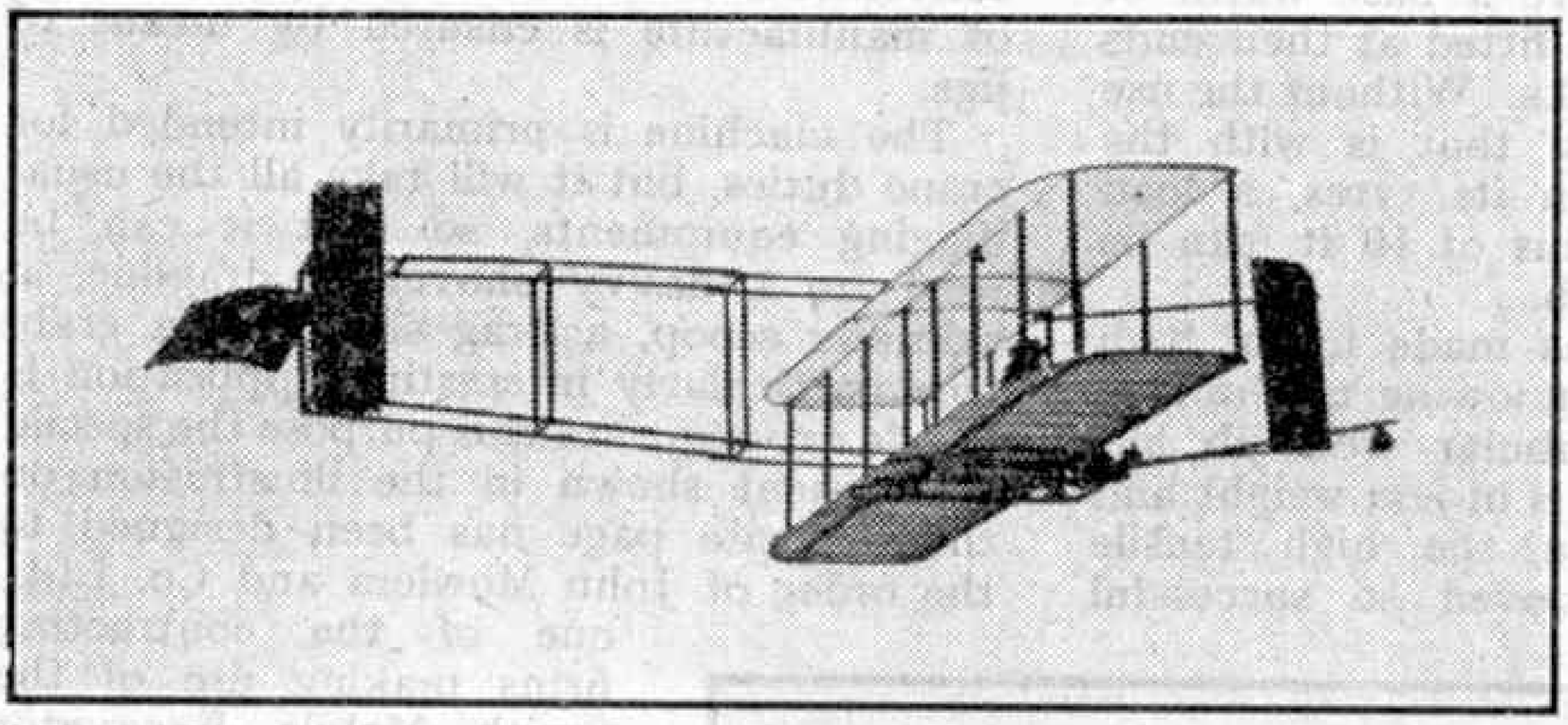
## In War and Peace

By C. G. Grey

*Founder of "The Aeroplane" in 1911, Editor till 1939*
*Editor of "All the World's Aircraft" 1915-1941*

OMITTING the legends of flying in days when history was even less to be trusted than it is to-day, such as the stories of Daedalus, who flew from Crete to Sicily or Italy, and Icarus, his son, who flew so high that the sun melted the fixings of his wings, so that he fell in the sea and was drowned, and omitting also the fantasies of the Italian Leonardo da Vinci, who thought so far in front of his times that he could not make the things he invented, we may say that aeronautics began in France in 1790 A.D.

Gas-filled balloons were invented and were used as observation posts by the armies of the French Revolution. Napoleon Bonaparte, the Great Emperor, did not use them, and nobody has explained why.



**An early Wright Brothers' glider flying at Kitty Hawk, U.S.A.**

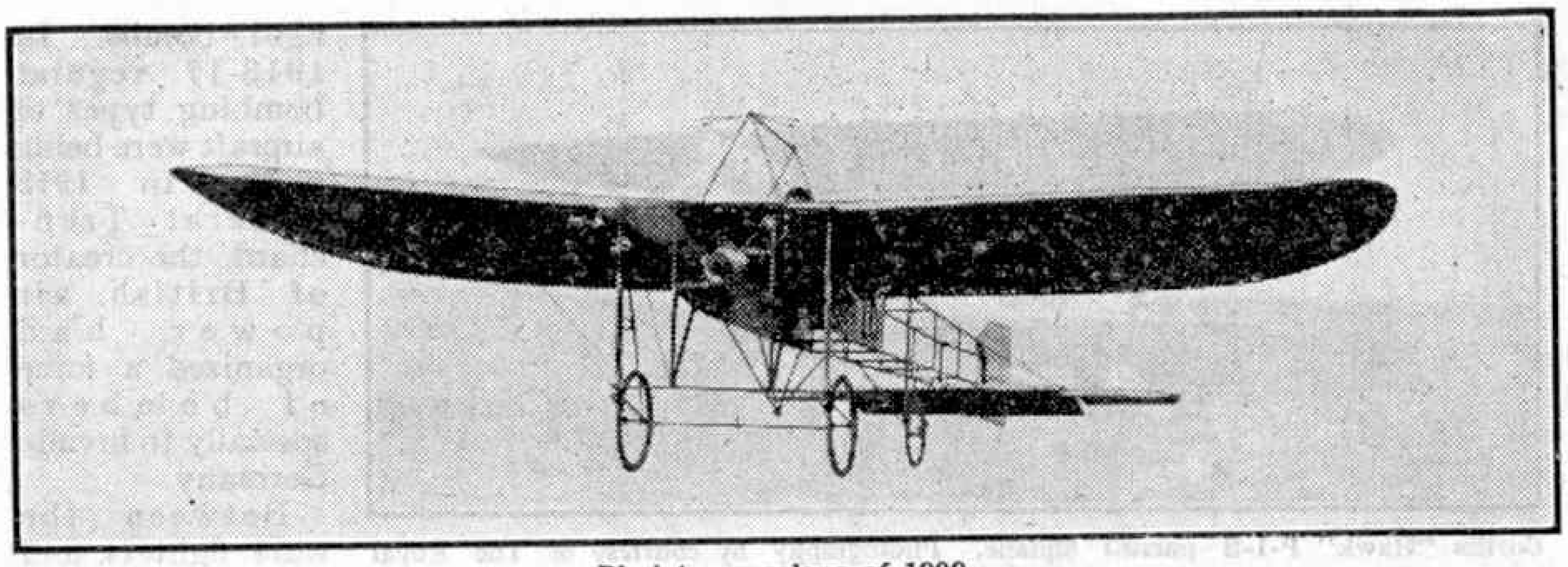
From the early balloons, 90 years later, the German Count Zeppelin, after many other inventors had failed, developed the airship, which made considerable voyages over Germany before anybody flew on an aeroplane, or heavier-than-air craft.

Note that airships, full of hydrogen or helium gas, float because they are lighter than the air they displace. Aeroplanes are lifted by the suction of the air which is deflected upward by the curve of the wings. Both airships and aeroplanes are controlled in an upward or downward direction, or sideways, by almost flat horizontal or vertical surfaces, which act on the air exactly as do the rudders of boats on water.

The first men to fly a heavier-than-air craft driven by its own engine, were the Wright Brothers of Dayton, U.S.A. But before them many men had left the ground on "gliders," that is to say aeroplanes without engines. There were Lilienthal, a German; Chanute, a French Canadian; and Pilcher, an English Naval officer, and many others. The first flight by Orville Wright was a mere hop, in 1903. The 'plane was launched from a rail by catapult and only travelled a few yards. In 1906 another hop covered some hundred yards. But by 1908 both Wilbur and Orville Wright were flying for an hour or more at a speed of 30 to 35 miles per hour. The tragedy of their story is that Wilbur died in 1912, and the type of design they produced could not be developed progressively. Therefore they made no advance after 1912, and Wright aeroplanes ceased to exist after 1914.

During 1908 and the following years Farman and Blériot in France; Glenn Curtiss in the U.S.A.; Short Brothers, Handley Page, Sopwith, Blackburn, Vickers, Avro, de Havilland, in England, made remarkable progress. Speed went up to 100 miles an hour. In fact in 1912 a French pilot in a Deperdussin monoplane flew 120 miles in one hour—the first time a human being travelled for an hour at more than two miles (3.22 kilometres) per minute.

Of all these pioneers the one who stands out as having had the greatest influence personally on aeronautical development is Glenn Curtiss. He had made a big name before 1907 in the U.S.A. by building and riding record-breaking motor bicycles. He was induced to join a private syndicate of Canadians, the head of which was Dr. Graham Bell, the inventor of the telephone. With his famous motors



**Bleriot monoplane of 1909.**

they built and flew successful aeroplanes in 1908, and by 1909 Curtiss had done many notable flights. In August 1909 he won the International Gordon-Bennett Cup in France. In 1912 he built and flew the first aeroplane off and on to water. It was mounted on floats (pontoons). Soon afterwards he built a small boat with wings. From that are descended directly all the great flying-boats of to-day, such as are familiar sights in Asia and Africa, Australia and New Zealand and America. And from them the English firm of Saunders-Roe have in the past year developed the biggest flying-boats in the world, with gas turbine engines.

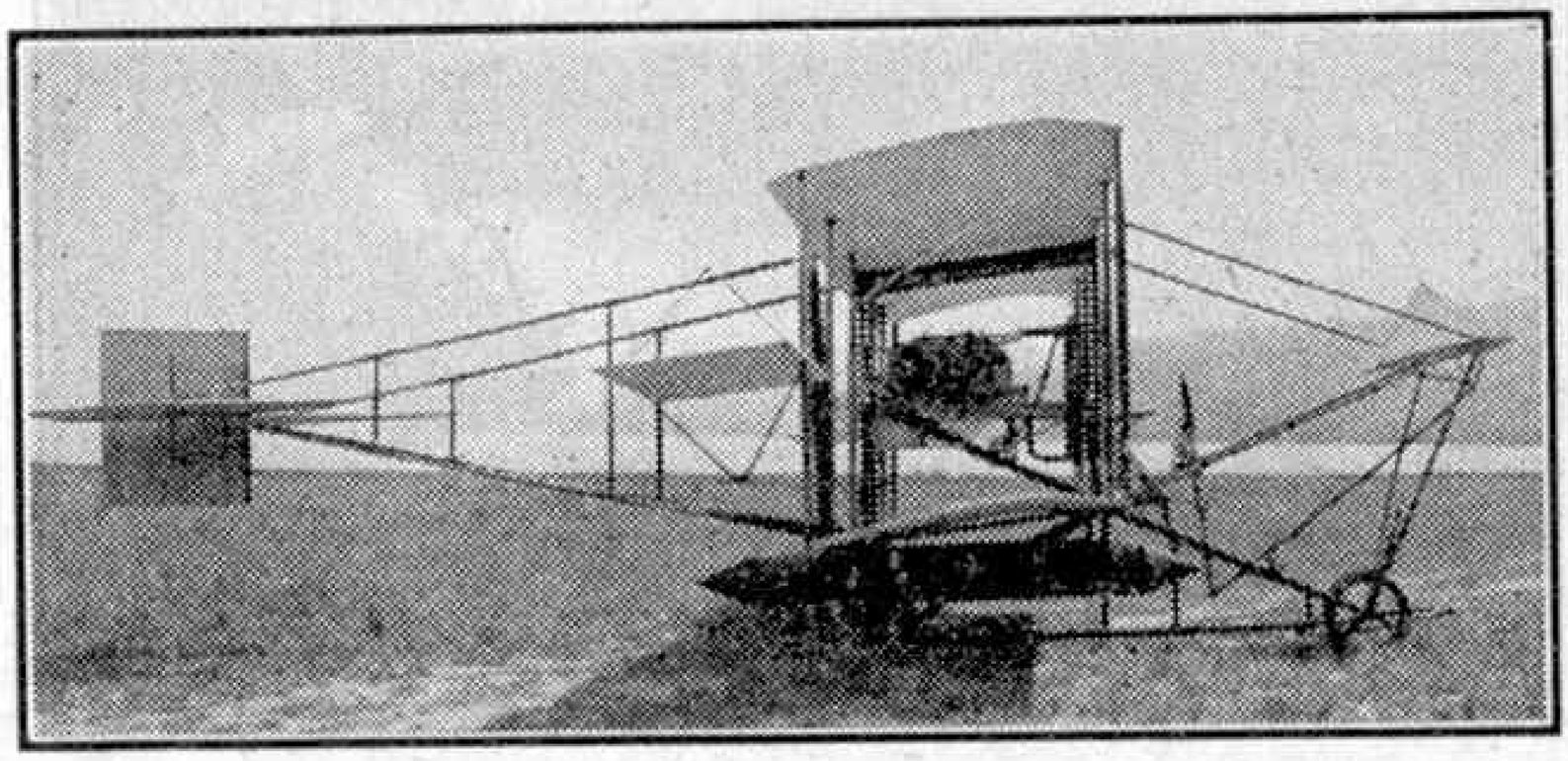
During the war 1914-18 Curtiss sold many big flying boats to the British Navy. They did splendid anti-submarine patrols, and in following years were developed greatly for the Royal Air Force. A Curtiss boat was the first aircraft to cross the Atlantic. Curtiss aeroplanes were also the first to fly off and on to warships, which started the idea of aircraft-carrying ships, such as in the U.S. Navy are replacing battleships.

Also during 1914 - 18 Curtiss built thousands of small biplanes for training, and from the little engines he made for them he developed his famous D.12 type motor, which broke many world's records and, being a 12-cylinder Vee-type engine with cylinders in one block of six on each side, it set the pattern to the world. In these days the type is only being displaced by the gas-turbine, which is used either for jet propulsion or to drive air-screws, more commonly known as propellers.

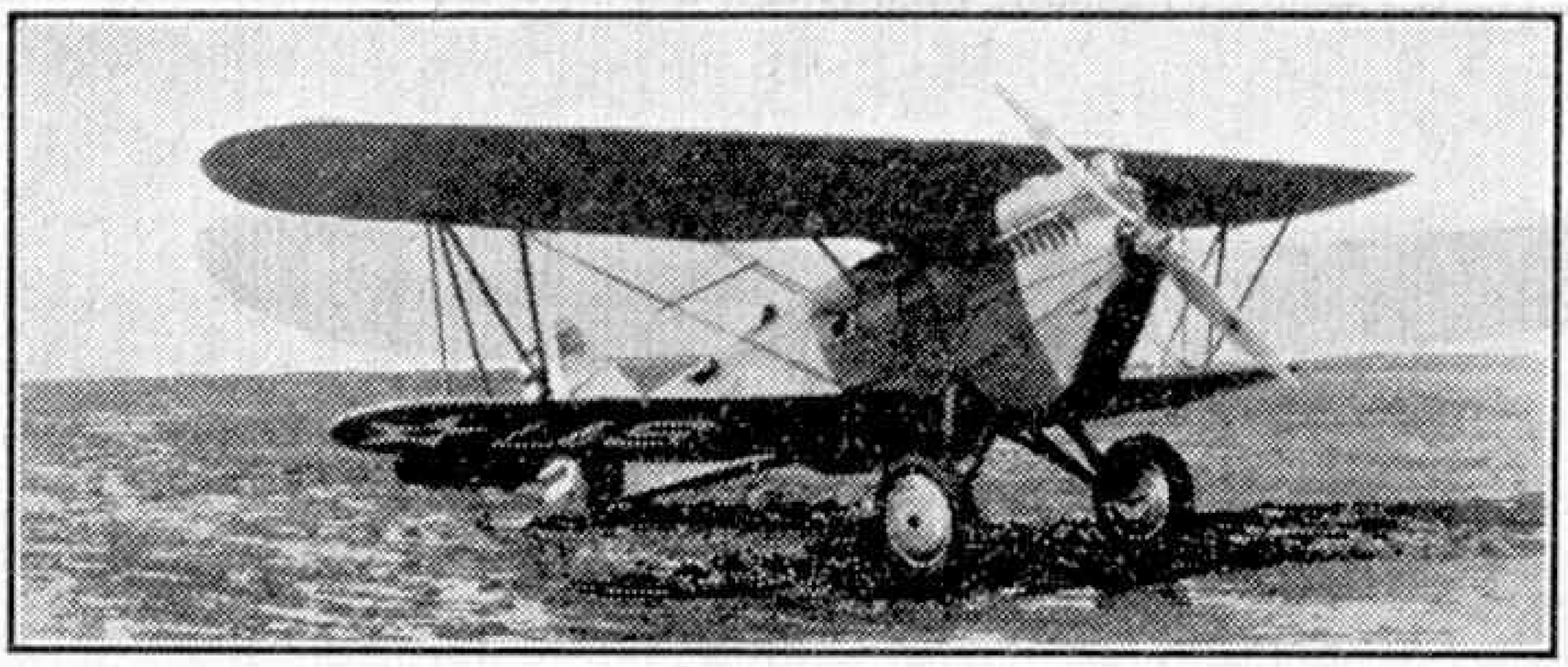
The development of Glenn Curtiss's original designs are in fact a history of the world's developments in aeronautics. But naturally other people had other ideas which developed at the same time.

In France Louis Blériot developed the monoplane and in 1911 had great successes. His aeroplanes won the great Circuit of Britain Race, and the Circuit of the European Capitals, and Paris-Rome and Paris-Madrid. He himself had already made history in 1909 by flying from Calais to Dover across the English Channel —thus showing the world that England was no longer an island.

An interesting point is that in those early days a high proportion of the pioneer pilots were officers of the armies or navies of their respective nations. Which was natural, for the officer class 40 years ago had money and time to spend, and were trained to risk their lives in war. So, as there was no war in 1908-1914, they were willing to attempt the conquest of the air. The Governments of the various countries began to understand, by 1912, that aircraft, both heavier and lighter than air, would play a big part in any future



**Curtiss biplane of 1909. Photograph by courtesy of The Royal Aeronautical Society.**



Curtiss "Hawk" P-1-B pursuit biplane. Photography by courtesy of The Royal Aeronautical Society.

war. So the armies and navies bought aircraft and trained officers and men to fly them—but mostly officers, because by mental and athletic training, and by higher education, they were better suited to the responsibility of observing the movements of enemy armies or ships—for in those days air-pilots were regarded as scouts (vedettes) rather than as fighting men.

The British Army formed the Royal Flying Corps in 1912. The British Navy's airmen were trained with them until August 1914, when the Royal Naval Air Service was formed just before the war against Germany. In 1918 (April 1st), by which time bombing and air fighting had been highly developed, the R.F.C. and the R.N.A.S. were formed into one Air Service and called the Royal Air Force.

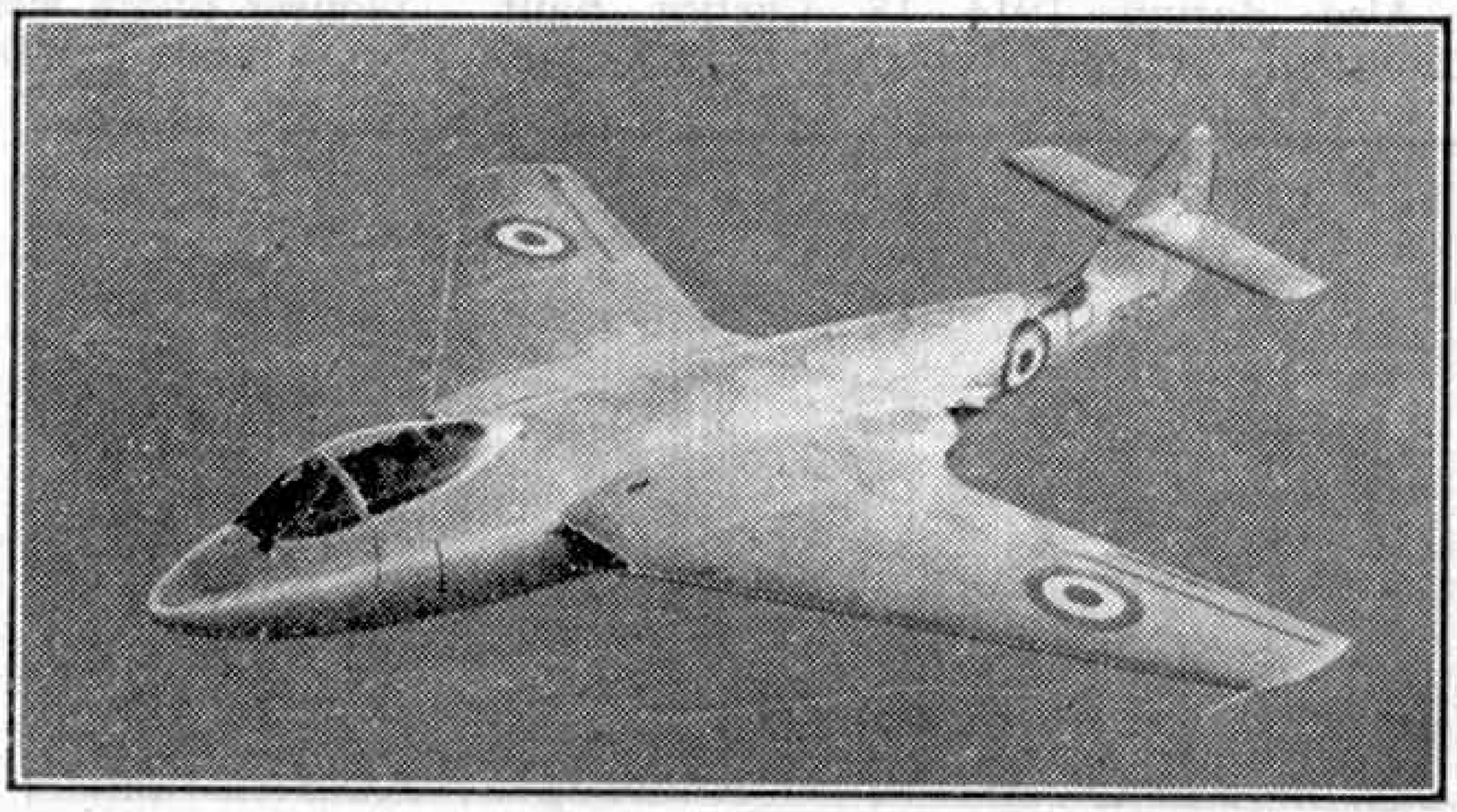
From that day to this the R.A.F. has been recognized as the spear-point of our fighting forces. In these days we do not talk of Defence Forces, for we know now that *defence* is the first stage of *defeat*. We know that only a strong striking force will prevent, or deter, aggressors from attacking us. So we call our striking or attacking Air Force, our deterrent or preventive force. If forced to war our Royal Air Force will attack, it will not defend, as in the historic Battle of Britain in 1940.

The development of aviation in war has been logical. In 1914 we regarded aircraft as scouts. In 1915 they were fighting one another and dropping light bombs. In 1916-17 regular bombing types of aircraft were being built. In 1918 General Trenchard, the creator of British air power, had organized a force of bombers specially to invade Germany.

Between the wars fighters and bombers became more distinct types. Bombers with two or three engines, such as the German Junkers, became common. In Civil Air Transport big passenger craft with two or three engines, and even four, were developed, and in the 1930–39 period we had big flying boats with four engines, cruising at nearly 200 m.p.h.

When war began in 1939 our bomber speeds (and those of the Germans) were up to 250-300 m.p.h. and fighters were near 400. By the end of the war, when our bombers and those of the U.S.A. were coming out of the factories in thousands, they wrecked the German output of war material and our fighters kept the German fighters on the ground. In the great battles in Normandy our newest fighters, firing rockets, smashed the German armour (tanks) and mobile guns, and won the war.

To-day we are developing turbo-jet fighters, bombers, and passenger craft; and perhaps more important from the passengers' view, airscrews driven by gas turbines, which seem likely to bring in a new era of air transport.



Hawker P1052, Britain's first sweptwing jet fighter. Photograph by courtesy of Hawker Aircraft Ltd.

# The Story of the Life-boat

## More than a Century of Life-saving at Sea

IN December 1948 the last of the sailing vessels of the Royal National Life-boat Institution's fleet left her station at Newquay, on the Welsh coast where her place was taken by a modern motor life-boat; and now there is not a station around the British Isles where power is not used for driving the vessels in which the men of the life-boat service go to the rescue of seamen and others in distress. Altogether there are 156 motor life-boats in service. These do the work that 40 years ago was carried out by 276 pulling and sailing vessels and four steam life-boats.

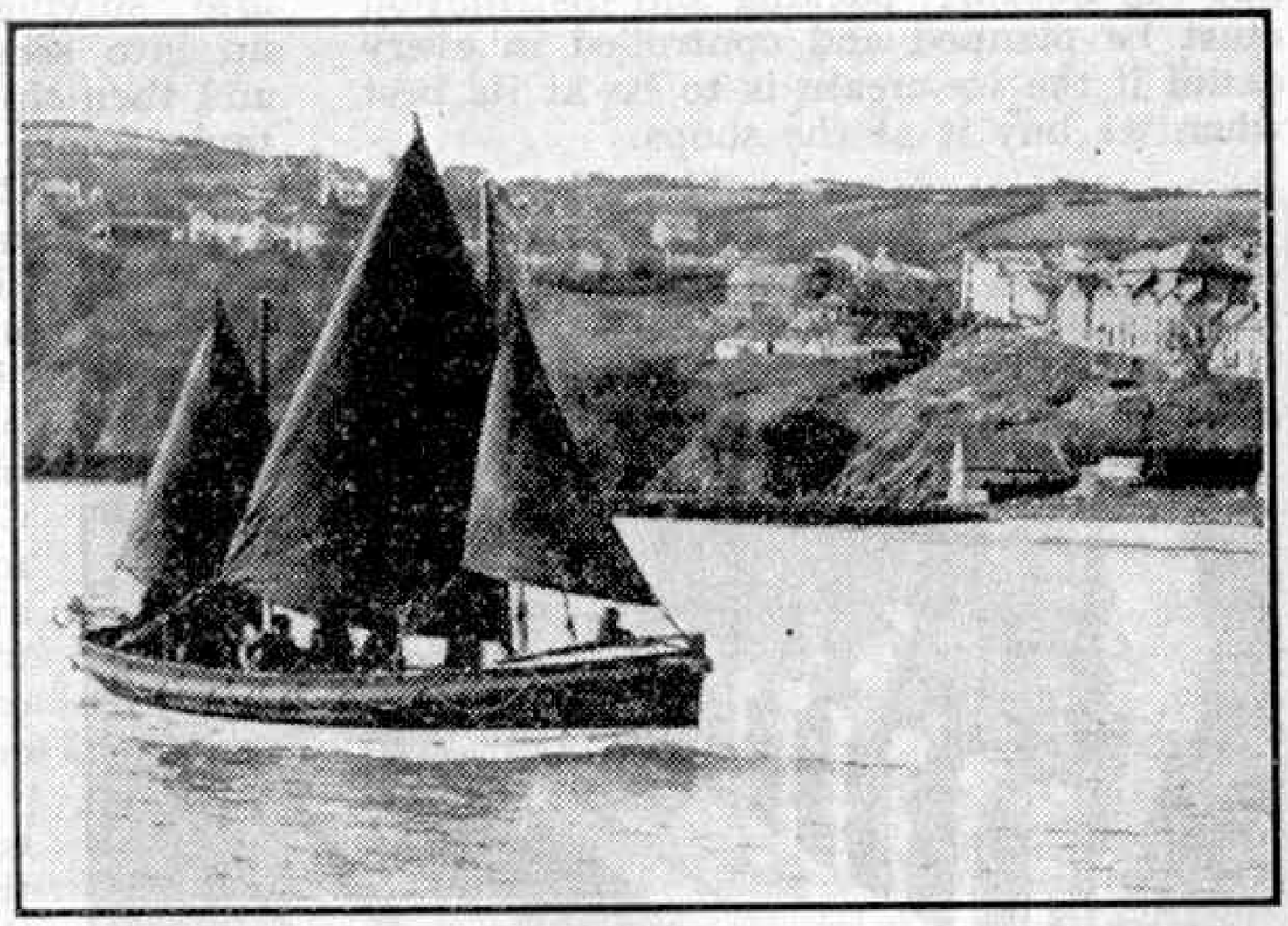
It is interesting to look back upon the history of the R.N.L.I., as outlined in a recent booklet.* The very first life-boat of all was based on a model designed by a house painter and teacher of music, William Wouldhave, and was built by a ship's carpenter, Henry Greathead. Wouldhave's model had the capacity to turn right way up again if it were capsized, and this has been a feature of many of the vessels since built. It is attained by fitting high air chambers at the bow and stern. But self-righting life-boats are narrow and have the disadvantage that they are less easy to handle in heavy weather. Above all things a life-boat must be sturdy and capable of manœuvring, so later more stable and seaworthy boats were built, trust being placed in the skill of the life-boatmen to keep them from capsizing. To-day only 21 of the 156 motor life-boats of the fleet are self-righting.

Needless to say, all life-boats are capable of taking the hardest knocks. They are built of specially chosen woods, each noteworthy for some quality that makes it specially fit for a particular part of the boat. All are capable of freeing themselves from water breaking over them, and however badly damaged they will not sink, as all empty spaces are filled with air cases, which are boxes of red cedar, covered with glue, stretched calico and paint. A life-boat has from 100 to 160 of these air cases, which would keep her afloat if 20 holes were knocked in her and she were full of water.

The first experiments with motor life-boats were made in 1904, and many problems had to be solved before real success was achieved. The engine itself had to be watertight, reliable and automatic, with simple controls that could be distinguished by touch in the blackest night. It had to work and keep itself oiled in all positions, even with the boat literally standing on end. Yet it had to stop automatically if the life-boat capsized, for otherwise it would carry away the boat without the crew when the vessel came up again. All these difficult conditions were triumphantly satisfied, and to-day the Institution possesses a fleet of superb vessels, worthy of the brave men who sail in them.

Still the search for improvement continues, and with the completion of the mechanisation of the fleet a new type of life-boat has been introduced that has many remarkable features. This latest type is 46 ft. 9 in. long, and is fitted with two 40 h.p. diesel engines To save weight the superstructure, mast and ventilators are made of aluminium alloy instead of wood, and this material is used also for a shelter for the mechanics and a deck cabin, a new feature.

While the work of providing better life-boats continues the dangers of the sea remain. It is easy to forget these until we are tragically reminded of them by a disaster such as that of April 1947, when the life-boat stationed at The Mumbles, near Swansea, capsized in a hurricane with the loss of her crew of eight, while 41 men of the vessel to the rescue of which she had gone also lost their lives. The spirit of the life-boat service also remains, however, whatever the dangers. More men of the village of The Mumbles at once came forward to take the place of those who had gone, and a new boat was in readiness for any call only eight weeks later.



**"The William Cantrell Ashley," the last of the sailing life-boats to remain in service, sails away from Newquay, Cardiganshire, where she has been replaced by a new motor vessel.**

The previous occasion on which a life-boat had been lost with all her crew was 20 years earlier, at Rye Harbour. In the intervening period life-boats went out on service over 9,000 times and saved nearly 12,000 lives, and more than 90,000 life-boatmen took part in these life-saving efforts. This is a wonderful record, for every life-boatman is a volunteer. Only the motor mechanic at each station is a paid servant of the Institution, the rest of the crews earning their living by fishing and in other ways. They know the seas around their stations, and respond nobly and instantly to every call for aid.

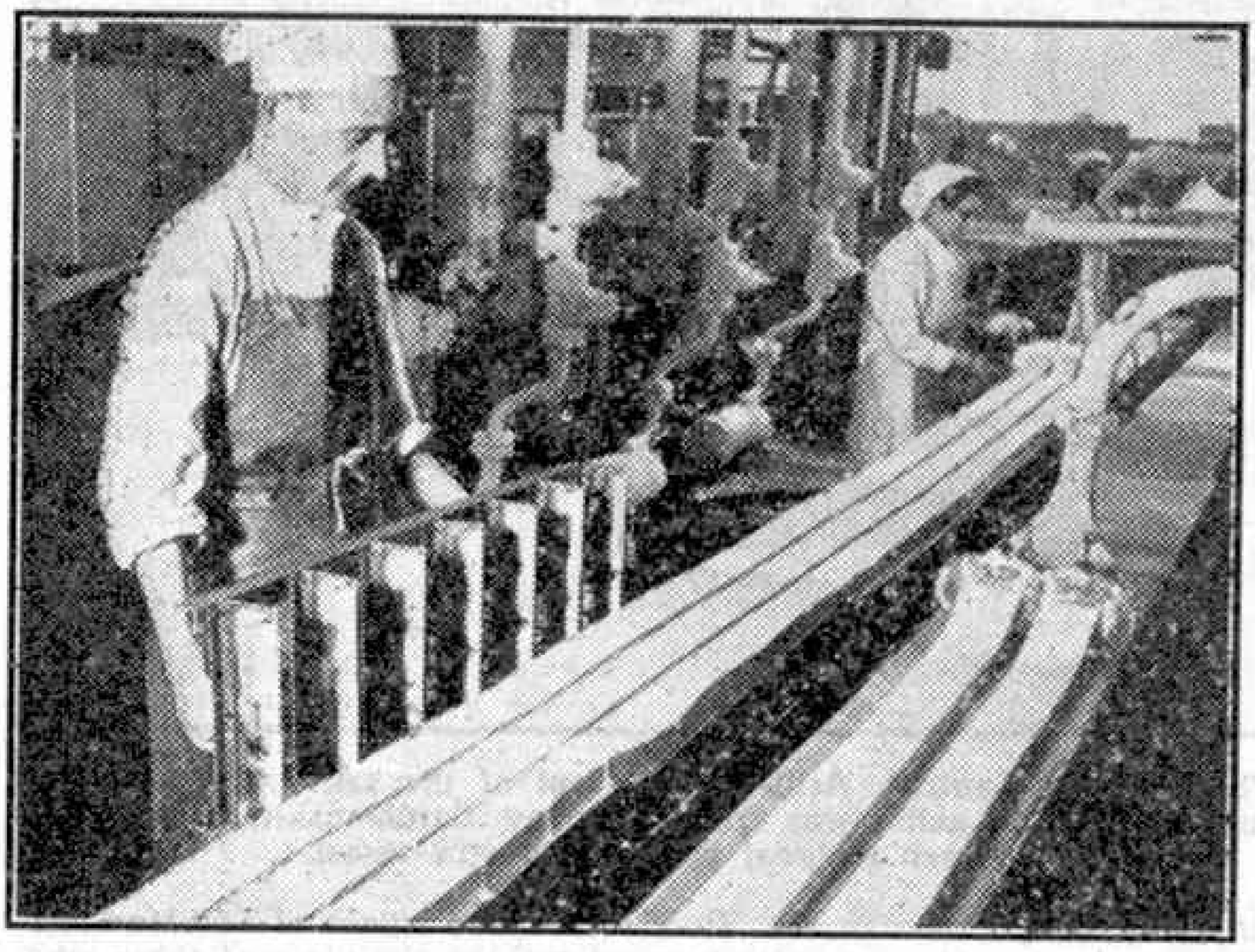
It is remarkable that such a wonderful service is provided and maintained entirely by voluntary subscriptions. On rewards, pensions and other payments to its coxswains, crews and launchers the Institution now spends over £106,000, and the whole annual cost is over £650,000. Those who contribute to this huge sum will find justification in the knowledge that the great array of men, women and children saved in the 125 years of the Institution's work would form a massive column, marching three abreast, that would fill over 28 miles of road and would take 8 hrs. to pass any given point.

*"*The Story of the Life-boat, 1824-1949." Royal National Life-boat Institution, Life-boat House, 42, Grosvenor Gardens, London S.W.1. Price 1/-.*

# Ice-cream by the Ton!

By T. R. Robinson

ICE-CREAM is a frozen confection, once a luxury, that nearly everyone likes, and in recent years it has become so popular that its manufacture has grown into a large industry. Some factories, such as that of T. Wall and Sons Ltd. at Acton, the activities of which are dealt with in this article, measure their daily output in tons, and to make ice-cream in such large quantities is a most exacting business. Not only must the quality of all the materials be of the very highest, but the freezing, packing and distribution must be planned and controlled in every detail if the ice-cream is to be at its best when we buy it at the shops.



**Ribbons of ice-cream leaving the extruders are cut into the required length as they travel forward on the conveyors. The illustrations to this article are reproduced by courtesy of T. Wall and Sons Ltd., Acton.**

The main ingredients are fats, sugar, milk powder and flour, and all these have to be blended into a smooth even reconstituted cream, which can be frozen to the exact degree necessary. Unless every process is correctly carried out, it is impossible to produce a perfect ice-cream.

The first stage of manufacture begins at the unloading bank, where the supplies are unloaded from the delivery lorries. Here, too, is the sugar-syrup pipe-line, through which the sugar, which arrives in liquid form, is pumped to the factory storage tanks from road tank wagons. Samples taken as each delivery arrives are checked for quality and purity in the factory laboratory, and no ingredient is released for use until tests have shown it to be of the required standard. If all is as it should be, the ingredients are transported to the mixing room, which is at the top of the building so that the cream mixture may flow from one process to another with as little pumping as possible.

In the mixing room are two groups of machines, one type dealing with the fats, and the other with the rest of the ingredients. Large blocks of fat are fed into "shiving" machines, which slice them up into sections that will melt rapidly, and then tip these into heated, glass-lined tanks each having a capacity of about 250 gallons. Paddles or beaters in these tanks continually stir the contents, to ensure perfect mixing. Meanwhile somewhat similar mixing operations are proceeding with the rest of the ingredients in other machines. Carefully weighed and measured quantities of each are fed through chutes into mixing tanks, and here again continuous stirring by paddles ensures perfect blending.

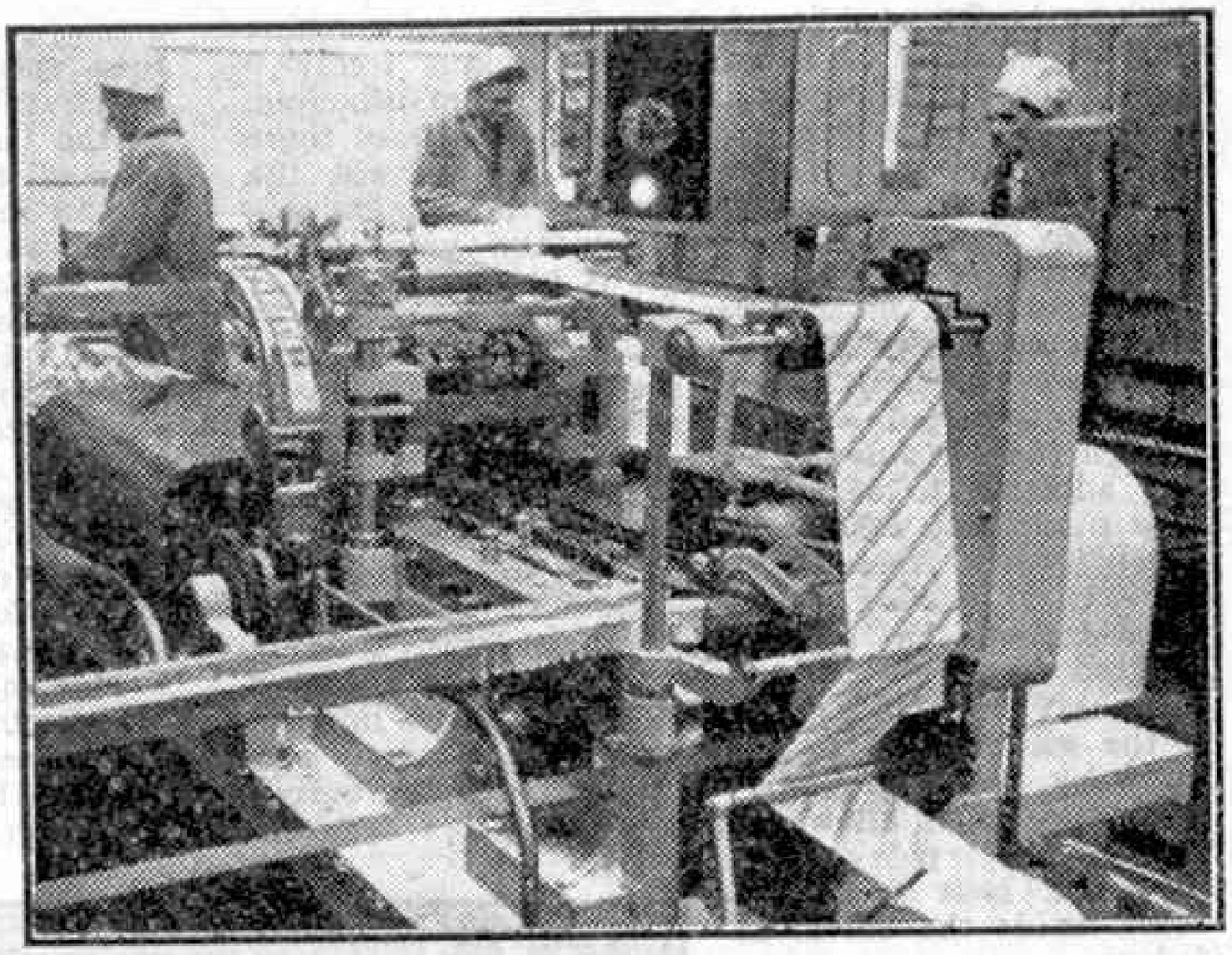
When the preliminary mixing is complete, the contents of the tanks are pumped into the pasteurizing room. Here the flour mixture first gets a special additional heat treatment, or "cook," which converts as much as possible of the starch in the flour into sugar. Once this is done, the melted fats are added, and the whole of the ingredients are blended in one or other of a group of stainless-steel pasteurizers. Pasteurization is the process by which any harmful bacteria that may be present in the raw materials are destroyed, and it is carried out by heating the mixture to 150 deg. F. and holding it at that temperature for 30 min. Time and temperature are automatically checked and recorded by instruments fitted to each pasteurizer. In order to avoid local scorching of the mixture the heat is applied by hot water sprays, enclosed in special jackets, a system that gives very even and controlled heating. Slow stirring by paddles during the process assists in even heat

distribution and keeps the mixture smooth. In the ice-cream industry the mixture at this stage of the process is called the "mix."

When pasteurizing has been completed the mix is pumped, as a safeguard, through a set of filters, which remove any undissolved particles that may be present, and then passes on to the "viscolizers" or "homogenizers."

It is at this point in manufacture that one of the most important processes of all takes place, for the "emulsifying," or complete blending of the fats with the rest of the ingredients is carried out in this group of machines. Up to this point the fat, though mixed with the sugar, milk and flour before pasteurization, has not been intimately blended into the mix. The completion of the mixing is done by the viscolizers, and the method used is to force the mix through tiny apertures at a pressure of 2,000 lb. per sq. in. The effect is to break up the fat into minute globules and to distribute these evenly throughout the cream. After this treatment the fat has no tendency to separate out from the other ingredients, and so spoil the mixture.

The preparation of the cream "mix" is now complete, and the next stage is that of cooling, in preparation for the actual freezing process. When it leaves the viscolizers the mix is still at pasteurizing temperature, and to reduce its temperature to a point slightly above actual freezing it is passed over a Mojonnier cooler. In construction this rather resembles a giant copy of the milk coolers that are often seen on farms. It is constructed of stainless steel, and is arranged so that the cream flows from top to bottom over corrugated surfaces. The top half of the cooler is water-cooled, and the lower part uses ammonia as a coolant. By this means, the cream is cooled in two stages as it flows over the corrugations or "leaves," and is reduced from 150 deg. F. to 35 deg. F. in a few seconds.

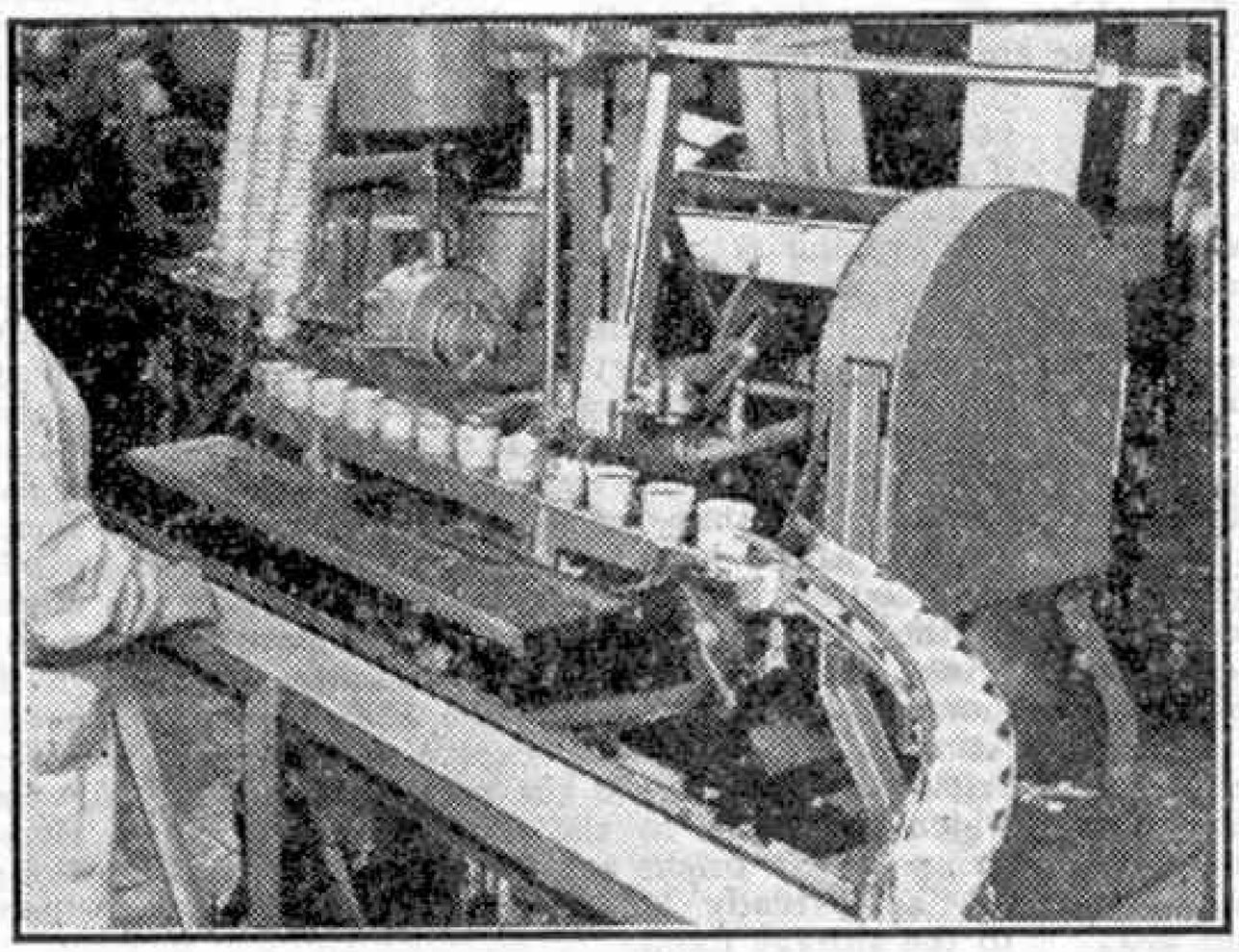


**This machine is capable of wrapping 180 ice-cream brickettes a minute.**

Having traversed the cooler, the cream flows by gravity to one or other of five large holding, or "ageing" vats on the floor below. Each of these vats has a capacity of 4,000 gallons, is glass-lined and is fitted with instruments for recording time and temperature. The mix is allowed to remain in these vats for a few hours in order to mature, and is kept at a temperature of 40 deg. F. This treatment brings it to just the right state for the freezing process.

In addition to the five main vats, there are three smaller vats, each of a capacity of 900 gallons, which are similarly used for ageing the flavoured mixtures used for special kinds of ice cream. These smaller vats are in a special bay at the end of the ageing room, and are fed by their own system of pipe-lines. In all other respects they are similar to the larger vats.,

When the mix has matured sufficiently it is drawn off and passed by pipe-lines to the freezers,



**Filling tubs with ice-cream.**

which are on the next floor below. The type of machine used for freezing is called a "continuous freezer," and all the machines operate on the same principle. Mix arrives at a hopper tank or vat, and from there passes to the first of two pumps. This feeds the cream to the second stage pump, on the suction side of which is an adjustable air intake valve. The construction of the two pumps is so arranged that the second runs much faster than the first, and so this second pump is able to take up not only the cream-mix supplied by the first pump, but also a carefully adjusted amount of air, which it draws through the air valve.

In addition to aerating the mixture, the second-stage pump also forces it forward into the "mutator barrel" of the freezer, and it is in this barrel that the actual freezing takes place. As the mixture passes through the barrel it is whipped into a finely textured cream by two scrapers, which are mounted on a shaft and make about 600 revolutions a minute. As the whipping takes place the aerated mix is also frozen by liquid ammonia that surrounds the barrel. This ammonia is allowed to boil away at a carefully controlled pressure, extracting heat from the cream inside the barrel as it does.

This action causes the cream to assume a stiff plastic consistency, and so prepares it for the subsequent packing and shaping processes. The air which has been incorporated by the pump gives to the resulting ice-cream a fine velvety texture, and the increase in volume of the cream due to the aeration is known as "over-run." The amount of this over-run is important in its effect on the finished product, and so it is constantly checked by special meters or scales.

When the cream leaves the freezer it is dealt with in one or other of several different ways, depending on the kind of packing used for the particular batch. Large cans of ice-cream are filled direct from pipe-lines fed from the freezers, the can being held in line with a suitably shaped delivery nozzle on the end of the pipe. Cartons are dealt with in much the same way, the nozzle in this case being rectangular, in order to eject, or "extrude" the cream in a proper shape for direct insertion into the carton itself.

Tubs are dealt with on a most ingenious machine of the conveyor type. The tubs are drawn from a magazine and placed on a horizontal conveyor that transports them to the filling point. There the pipe-line from the freezer terminates beside an oscillating filling-head, which resembles a drum and is pivoted so that it can turn alternately right and left through a semicircle. In the drum are two pockets, each of which when full contains exactly the right quantity of ice-cream to fill a tub. Cream from the pipe-line is forced into the pocket that is in line with the filling nozzle, and then, as a tub arrives below the drum, the latter makes a half turn and the cream in the pocket is ejected into the tub. As this takes place, the other pocket is being filled ready for the next tub, and when this arrives the drum moves back to its original position, and the whole cycle is repeated.

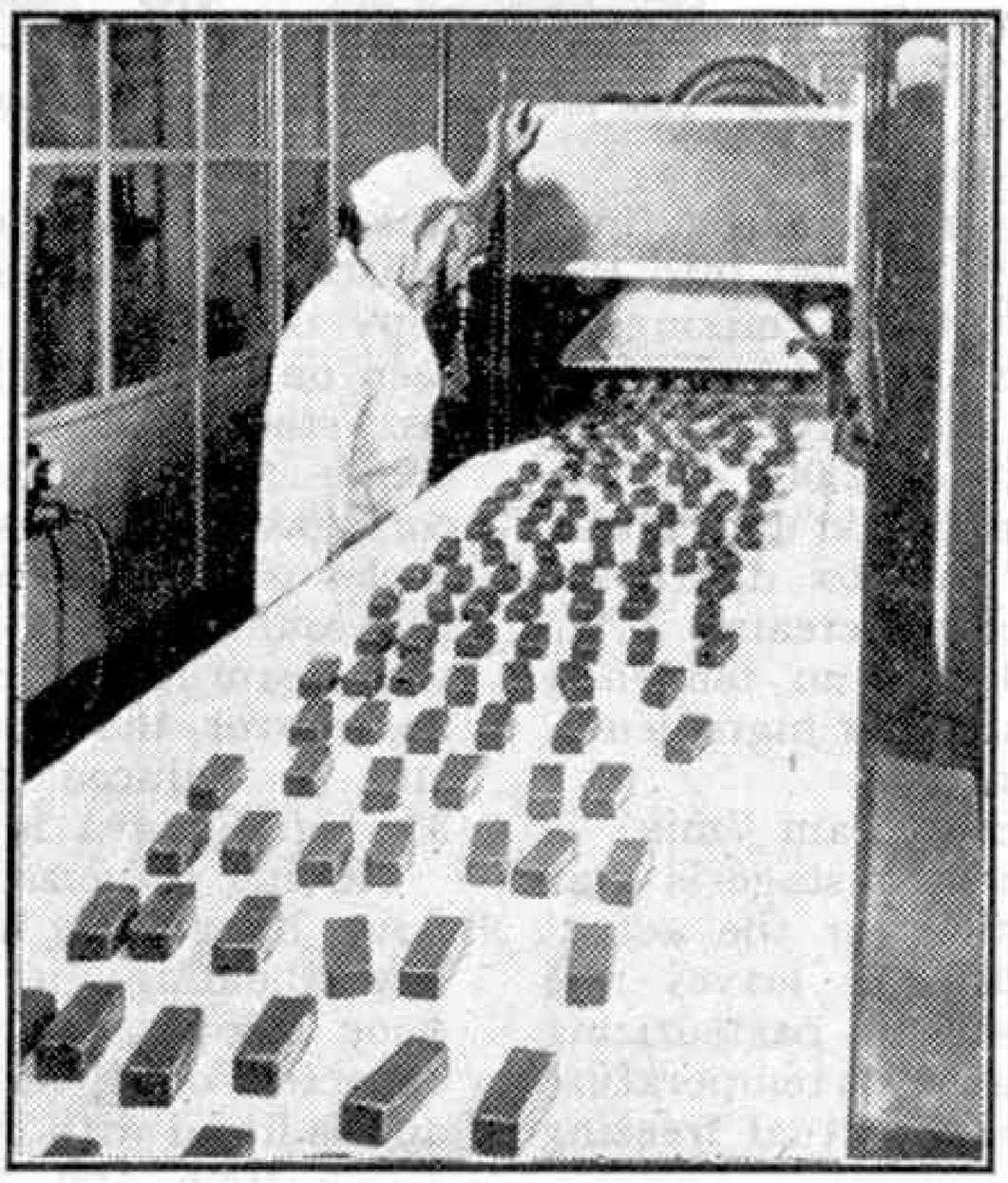
The filled tubs move along the conveyor and next arrive under a further magazine, from which a lid is fed and placed in position by an automatic arrangement of steel fingers. The filled and sealed tubs then move onward to yet another conveyor, which takes them away for packing and transport to the hardening tunnel.

In all these forms of packing, the ice-cream is still in the form of a plastic cream when it is inserted in its can, carton or tub, and to make it finally ready for despatch it requires another freezing process. This takes place in the hardening tunnel just mentioned. In the tunnel the various kinds of packings move slowly along, and as they do so they are subject to a blast of cold air at a temperature of 20 deg. F. below zero. The effect of this blast, during the 50 min. that the packages take to traverse the tunnel, is to harden the cream completely. The rapidity of the hardening is a most important point, for it allows only very fine ice crystals to form and so retains the correct texture.

The method of production used for bricks and "brickettes" is not quite the same as for other packs. For these the ice cream is extruded in the shape of a long thick ribbon. As this ribbon emerges from the extruder nozzle it falls on a conveyor, and if it is to be used for bricks it is then cut into the required lengths by a multiple knife, which shapes 18 bricks at a stroke. These cut sections then pass along conveyors to the hardening tunnel.

Brickettes and choc-bars are not cut into their final lengths at this stage, and the ribbons for them are sent to the hardening process in long sections. When these have passed through the tunnel, they are conveyed to the various machines which will cut, coat and wrap them.

Brickettes only need cutting and wrapping, and ribbons for these are first fed to a guillotine cutter, which divides them into sections of the correct size. They are then automatically transferred to a further conveyor, moving at right angles to the first. At this point any sections which are too large or small are rejected, and only the correct sized brickettes reach the wrapping mechanism. This operation is most important, for the machine could not operate correctly if wrongly sized brickettes were to reach the wrapping section.



**Chocolate coated bars of ice-cream moving along the conveyor after the enrobing process.**

Wrapping is a most interesting process. A wheel with a number of pockets spaced round its circumference moves round, step-by-step, and, as each pocket reaches a certain point, a piece of wrapping paper is cut from a roll and inserted in it. The wheel then moves forward, and at the next point a brickette is inserted into the paper, which is suitably held ready by the shape of the pocket. Further movement of the wheel brings each brickette and its paper into contact with fingers that fold over the edges of the paper, and then another forward movement brings the partly wrapped brickette into line with more fingers that fold in the ends of the wrapping. At the next step the pocket opens slightly, and the brickette drops out of the pocket on to the conveyor which moves it to the final packing point. Here, groups of six bricks are wrapped in an outer packing of paper, ready for the conveyor that takes them to the storage room.

The automatic devices on this machine are most ingenious. If a pocket on (*Continued on page 389*)

# BOOKS TO READ

*Here we review books of interest and of use to readers of the "M.M." With the exception of those issued by the Scientific and Children's Book Clubs, which are available only to members, and certain others that will be indicated, these should be ordered through a bookseller.*

### "ELECTRICAL TIMEKEEPING"

By F. Hope-Jones, M.I.E.E., F.R.A.S.

(N.A.G. Press Ltd. 21/-)

Electric clocks are so familiar to us that we hardly ever think of the vast amount of work that has been devoted to bringing them to their present high efficiency. The story of their development, and of the way their correct construction was evolved, is quite fascinating, and no one is better qualified than Mr. Hope-Jones, who has himself made some of the most notable improvements in electrical horology. The account he gives is an excellent one, which starts right at the beginning, and then goes stage by stage through the growth of the electric clock until it arrives at the wonderful perfection of the Shortt-Synchronome "Free-Pendulum," which remains the most accurate pendulum clock in the world.

The book is a second edition, thoroughly revised and brought up to date, and every chapter has been checked and the wording improved where possible. Each new development that has come along since the first edition was published has been added to the story, and as a result the book is remarkably complete. The inclusion of an account of the Horstmann-Clifford magnetic escapement is an example of this, the principles being well described and illustrated. An entirely new chapter has been added to deal with the quartz crystal clock, and though the principles involved in its operation are somewhat complex, the description is very good indeed, and clearly understandable.

Almost every line drawing has been re-drawn, and the new illustrations are a great improvement, being clearer and more uniform in style. One or two have been added, and are very helpful indeed. It is a pity that the drawing of Grimthorpe's gravity escapement was not redrawn, for it is not quite correct in detail, and could be improved considerably.

Several new plates, mostly portraits of inventors, have been added, and there is a very good illustration of the mechanism of a "Free-Pendulum" master clock, which gives an excellent idea of its construction.

Altogether, the book is one of the best of its kind. It should prove most useful to those who are interested in clocks of all kinds, and the excellent style of the author should help considerably in a clear understanding of the way in which electricity has given us such an accurate means of measuring time.

T. R. Robinson.

### "THE OBSERVER'S BOOK OF HORSES AND PONIES"

By R. S. Summerhays (Warne. 4/6)

Even in this mechanical age most of us are interested in horses and ponies, and will welcome this very interesting and handy little volume. It is claimed that never before has the subject been compressed into a book that can be carried in a pocket, and the reader who is not an expert will be astonished not only by the amount of information given, but also by the number of breeds of horses described in it. There are 90 of these, each with its own special features, and it is very interesting to realize how they have been developed with particular purposes in mind, or to suit conditions in widely differing parts of the world.

The descriptive matter is excellent, and each breed is illustrated by means of a good half-tone photograph. The book is one that should be in the hands of all who have any interest in horses, and reading it will help to increase their admiration for man's most useful friend in the animal world.

### "THE 'KINGS' AND 'CASTLES' OF THE G.W.R."

By O. S. Nock, B.Sc. (Ian Allan Ltd. 3/6)

This recent Ian Allan publication forms No. 5 of the "Famous Locomotive Types" series, several numbers of which have already been referred to in the "*M.M.*" Mr. Nock has frequently contributed to our pages in the past. He is a real locomotive enthusiast, with a specially intimate acquaintance with the engines here dealt with, and he tells his story with his usual efficiency.

To appreciate any locomotive class, it is necessary to know something of its background and pedigree. So we begin with the predecessors of the "Castles," going back to the early years of this century. The development of the "Castles" themselves and of the bigger "Kings" is then explained, and notable performances by both classes under test and in every-day service are given. The remarkable runs recorded with the "Cheltenham Flyer," an exclusive "Castle" duty for many years, are fully dealt with.

The multiplication of the "Castles" to form practically the standard Great Western express engine from 1923 to the present time brings the reader to the final chapter in which notes are given on individual "Castles" and "Kings." Tables giving dimensions, names and numbers, diagrams of footplate arrangements and general arrangement drawings of both classes complete the technical details.

As usual with Ian Allan books there is a wealth of interesting half-tone illustrations. The book can be obtained from booksellers, or direct from Ian Allan Ltd., 33, Knollys Road, Streatham, London S.W.16, price 3/9 post free.

### "A.B.C. OF LONDON'S TRANSPORT"

**No. 1, Buses and Coaches (3rd Edition) 2/-**

**No. 2, Trams and Trolley Buses (2nd Edition) 2/-**

(Ian Allan Ltd.)

The popularity of previous editions of these handy booklets, and the increasing interest in the various vehicles operated by London Transport, have made these further editions necessary. Each follows the usual "A.B.C." system and includes well-reproduced illustrations of typical vehicles of London's road transport system.

Copies cost 2/- each from bookstalls and Ian Allan agents, or 2/2 including postage direct from the publishers at 33, Knollys Road, Streatham, London S.W.16.

### "MODEL CAR MANUAL"

By G. H. Deason (Drysdale Press. 7/6)

This book is an excellent introduction to the growing modern hobby of building and racing miniature cars. The author, who is the Editor of "*Model Cars*," gives step-by-step instructions for the building of a nice variety of cars, so that the Manual is a thoroughly practical guide to the solution of the problems of power units, chassis design, steering gear and transmission that arise in the construction of miniature cars that really work.

Some of the designs are free-lance in character and others follow definite prototypes. There are simple models for beginners with rubber as the motive power, and internal combustion, rocket, jet and electric power units all have their places in the book. Attention also is given to the building up of cars from commercial kits. Remote control as applied to miniature motor cars is given special consideration and track matters are dealt with in some detail. Excellent illustrations complete a useful book.

# Railway Notes

By R. A. H. Weight

### Good Timekeeping of Passenger Trains

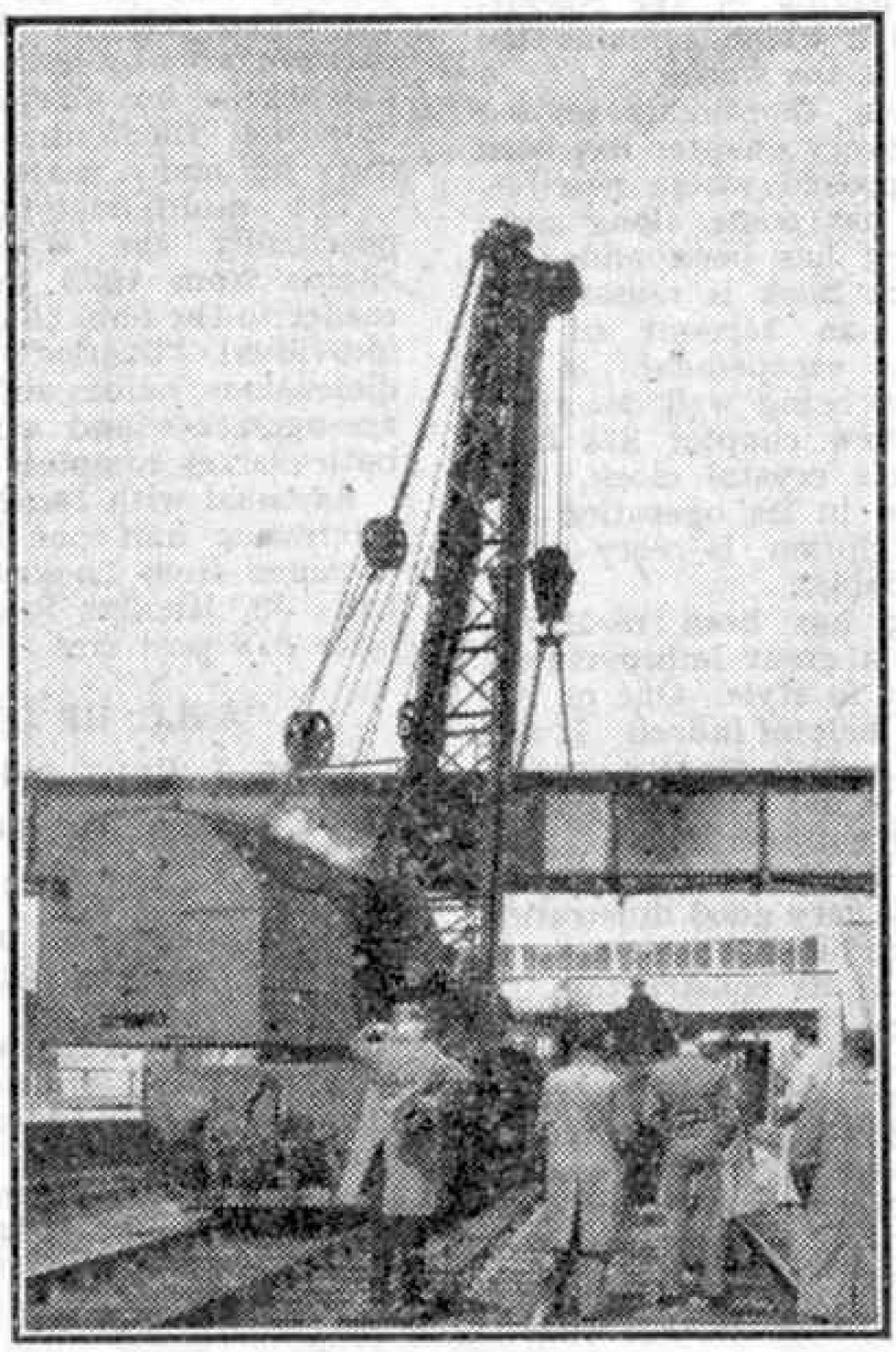
British Railways' trains are more punctual now then at any time since before the war, the Railway Executive recently announced.

A careful check was made during a four-weekly period in early summer when, of the 608,146 passenger trains run, 94 per cent. arrived punctually or within 5 min. of their booked arrival time. Express services were 61 per cent. punctual while 81 per cent. were no more than 5 min. late. The figures for all other trains were 79 per cent. on time throughout the four weeks, which is very creditable in view of the many possible causes of delay which may crop up in the course of long or short journeys.

In this connection it is interesting to learn from the "*Southern Region Magazine*" that during the same period both steam and electric trains averaged only just over half-a-minute late at destination. On one day the average late arrival of all trains in the Region was only 0.36 min., a post-war record. Freight working has also greatly improved in punctuality compared with the busy and difficult times just after the conclusion of hostilities.

Analysing the work of the different steam train crews, a S.R. Motive Power Department announcement indicates that of the principal passenger engine sheds, St. Leonards (Hastings) secured top place with a mean loss of only 2.01 min. lost per 1,000 miles run. Next came Exmouth Junction (Exeter), Eastleigh, Nine Elms (London, Western Sec.), Bournemouth, Salisbury, with average losses of no more than 2.19 to 4.30 min. per 1,000 miles, the other chief Eastern Sec. depots being on that occasion lower down the list.

Now that the height of the holiday season has passed, we may hope that similarly good service may again be to the fore.



**A footbridge being lifted by a 36-ton crane during rebuilding operations at West Ruislip Station. Photograph by C. R. L. Coles.**

### Transformation at Liverpool, Lime Street

The important L.M.R. terminus known as Lime Street in Liverpool, which was for many years before grouping a grey and solid looking local headquarters of the former London and North Western Railway, afterwards becoming the main Liverpool station of the Western Division, L.M.S., had in recent years become greatly in need of modernization and improvement in order that present-day long trains, engine movements, also heavy traffic working generally, could be dealt with more efficiently. The greater part of the station as well as the approach lines, largely through tunnel or cutting from Edge Hill, 1½ miles away, was originally excavated out of solid rock. Much more hard material of this kind has had to be cut away in order to provide space for the new 70 ft. turntable and new signalling installations now in use as part of the modernization and extension just completed.

The old signal box was awkwardly situated between running lines. Its successor in a new location is a fine brick and concrete, three-storied edifice with the latest electric operation in connection with a new installation of colour-light signalling, track circuits, route and "right-away" indicators to help drivers. Lengthening of platforms and improvements in track layout have also formed part of a bold plan, difficult to carry through on account of the confined location. But for the war this scheme would probably have been completed some eight years ago.

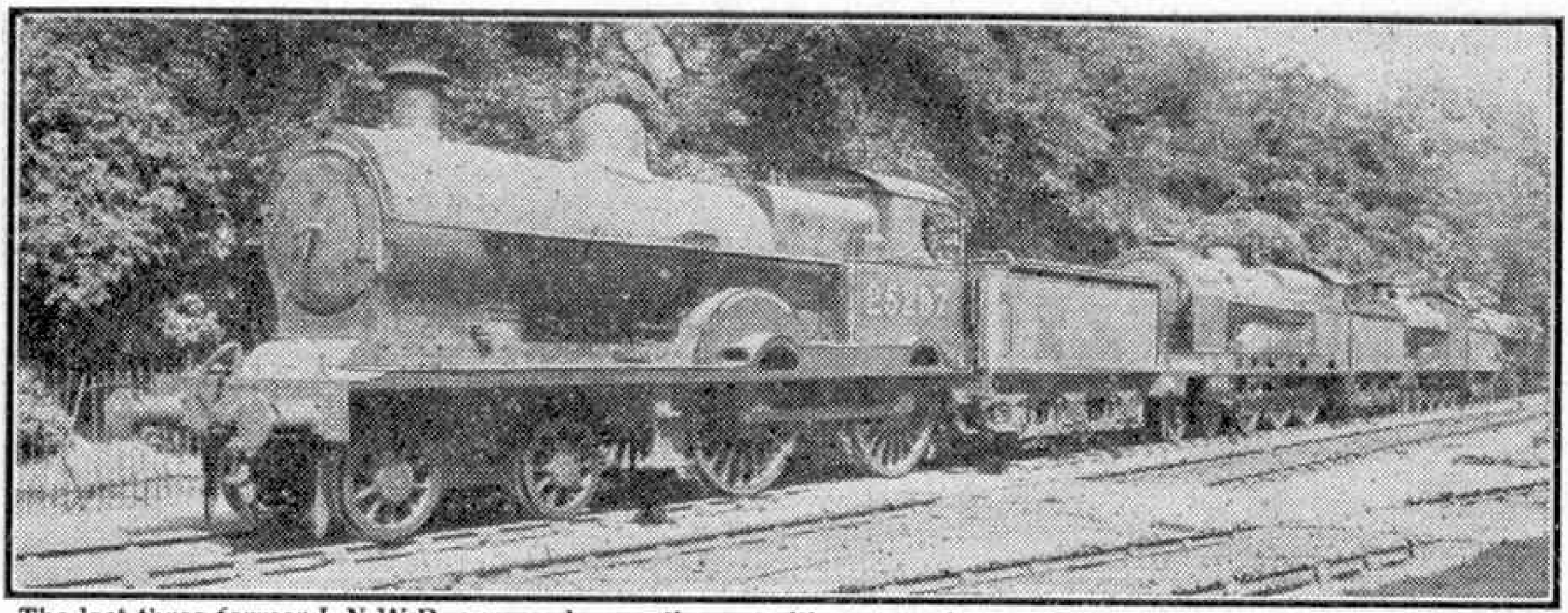
### Pennsylvania Progress

The great railroad system of the U.S.A., the Pennsylvania, has achieved substantial progress with its new locomotive and rolling stock programme despite delays caused by material shortages and other factors. The stock of diesel electric passenger locomotives, as well as diesel shunting engines, has been considerably enlarged while the stud of steam standard types of very large size continues to perform heavy work over many sections. Many of the famous named expresses, such as the "*Broadway Limited*," "*Trail Blazer*" or "*Pittsburgher*," are being provided with new sleeping, observation, dining or lounge cars which are of a size and weight considerably beyond British limits.

### London Midland Region News

We are able to reproduce this month an official photograph taken at Crewe of the sole surviving "Precursor," "Claughton" and "Prince of Wales" class engines before they proceeded to the breaking-up yard. These were the last representatives of L.N.W.R. express engines and have recently been condemned in quick succession. Brief details have been given in recent issues of the respective numerous classes to which these last survivors belonged. With the "George the Fifth" 4-4-0s, the superheated version of the "Precursor" class, these engines were the mainstay of the West Coast Route in England, and its principal branches, for many years from the early part of the present century.

New locomotives have lately been placed in service as follows:—4-6-0, class "5" mixed traffic: Nos. 44659-60, allocated to 21A, Saltley; No. 44661 to 17A, Derby; No. 44662, 16A, Nottingham; No. 44663, 15C, Leicester; Nos. 44664-5, 19A, Sheffield; No. 44666, 20A, Leeds, Class "4" 2-6-4T; No. 42111, 25F, Low Moor; Nos. 42112-6, 5D, Stoke, on loan to Low Moor. Class "4" 2-6-0 mixed traffic; No. 43035, 20H, Lancaster; No. 43036, 22A, Bristol; Nos. 43037-8, 19A, Sheffield; No. 43039, 20A, Leeds. Diesel electric shunters, 0-6-0: Nos. 12054-5, 5B, Crewe South. Four more Midland Compounds withdrawn were Nos. 1008, 1010, 1013, 1042. Certain interchanges or loans of locomotives are taking place between Regions, including the Scottish, which now has a separate administration and stock allocation, but Scottish engines are numbered in L.M or E. and N.E. series.



**The last three former L.N.W.R. express locomotives awaiting scrapping at Crewe. They are No. 25297 "Sirocco" (L.N.W.R. No. 643), No. 6004, (L.N.W.R. No. 42 "Princess Louise"), and No. 25752. British Railways Official Photograph.**

### Eastern and North Eastern Regions

The latest Darlington built "A1" 4-6-2s are Nos. 60150, stationed at Heaton; 60151 at Gateshead; 60152 at Haymarket (Edinburgh), Scottish Region, where Peppercorn engines are now seen more freely. No. 60129, constructed at Doncaster and painted blue, is at York. Further "A1s" are in hand at Doncaster, including some with roller-bearing axleboxes.

Speeds up to 80 m.p.h. are allowable again over sections of the old G.N.R. main line, though there are still stretches restricted to 60 or 70 m.p.h. on account of heavy traffic or condition of roadbed.

A typical day's observation of the Saturday traffic along the East Coast main line to and from King's Cross n the height of summer showed that the invaluable "V2" 2-6-2 engines still take a considerable share in express haulage, although more of the new "A1" type are now in evidence. Gresley "Pacifics," streamlined and otherwise, were working many of the principal long-run turns; "A4s" being on the "*Capitals Limited*," the "*Flying Scotsman*" and the "*Yorkshire Pullman*." The 4-6-4, long known as "*No. 10000*," now 60700, went north in fine style on the 1.35 p.m. Hull express. "B1" 4-6-0s were on 12—or13—coach holiday trains as well as on Cambridge or similar workings also shared by "Sandringhams" and new "L1" tanks. The colourings of rolling stock are many and varied, the L.N.E.R. teak predominating.

Some excellent performance has again been recorded on the "*South Yorkshireman*" with heavy loads behind "B1" No. 61185 of Leicester shed. On the trip southbound, with about 430 tons full, Rugby was left 4 min. late and the 36½ miles to passing Grendon Underwood Junction were covered in 39 min. over a road by no means easy, with minimum speeds of 40½ at Charwelton, then 30, owing to a permanent way slack after Culworth. Maxima on descents after Brackley were 79, then 83½ m.p.h. After a signal stop, Aylesbury was reached in 54 min. though the overall time would have been no more than 50 with a clear road, compared with a fast booking of 52 min. Northbound from Marylebone with a heavier 13-coach train, probably 450 tons and well over the rostered load, time was well in hand in spite of two track repair slacks.

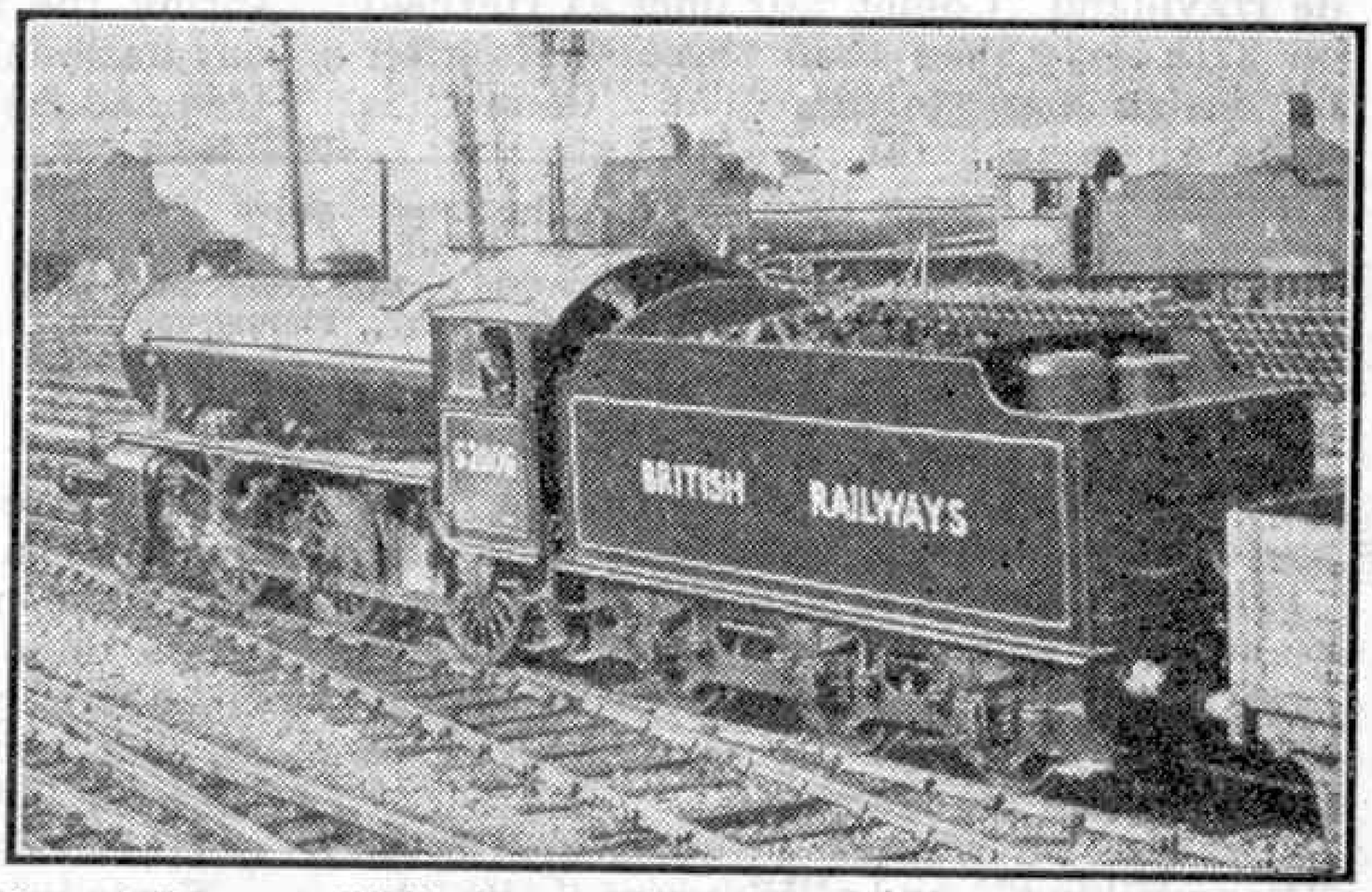
"A3" and "V2" engines are seen on the G.C. Section a good deal, also on the Harrogate main line of the N.E. Region. L.M.R. 2-6-0s and class "5" 4-6-0s have worked through specials to Scarborough, where several "K3" 3-cylinder 2-6-0s have lately been noted together with a good many "B16" and "B1" 4-6-0s, 4-4-0 "Shires" or "Hunts" and 4-6-2Ts.

### Irish Railway News

We are informed that the statement in last month's "*Railway Notes*" that the Great Northern Railway (Ireland) had been partly merged into the Ulster Transport Authority is not correet. As a matter of fact we believe that the G.N.R. (I) is the sole remaining main line railway undertaking controlled by private enterprise in Great Britain and the Republic of Ireland.

### Southern Tidings

Four different L.B.S.C. "Atlantics" were recently noted at work on one day. Engines of this class as well as "King Arthurs," "West Countries" and "Moguls" have been hauling relief Newhaven boat trains, some of which are also worked electrically. The first "Leader," No. 36001, was running trials on the Uckfield line in August when holiday coastal traffic was at its height, with much interesting locomotive variety in evidence.




**One of the new "K1" class 2-cylinder 2-6-0 of L.N.E.R. design at Eastfield (Scottish Region). Photograph by H. C. Casserley, Berkhamsted.**

Among recent withdrawals were: crane tank 0-4-0, No. 1302, originally built by Neilson for the S.E.R. at Ashford Works, in 1881; "T1" 0-4-4T No. 30001 (L.S.W.R. No. 1); rebuilt Stirling 4-4-0 Nos. 1446 and 1455, originally built in 1898/9.

ELEVEN months ago I wrote an article for the "*M.M.*" entitled "*British Jets are Still the Best*," a title that is even more appropriate to-day. At that time we had the finest jet fighters and the only medium-range jet air liners in the world, powered by the best pure-jet and propjet engines ever built. Now we can claim also the first long-range jet air liner, a whole series of new and advanced fighters, a promising jet bomber, and new engines of phenomenal power to fit into still secret aircraft in the experimental shops and on the drawing boards of our aircraft industry. Small wonder that the American Deputy Air Force Chief of Staff admitted some months ago that Britain is two years ahead of the rest of the world in the development of jet aircraft.

One of the most significant events of recent months was the first flight of the de Havilland "Comet" air liner at Hatfield on 27th July, less than three years after its design was started. The "Comet" is more than just the world's first real pure-jet air liner, for it offers such a tremendous increase in performance that American airline operators, who have no comparable American aircraft available, may well be compelled to "fly British," just as we now reluctantly have to fly American.

There is an old saying that if an aeroplane looks right then it is right, in which case the "Comet" should be a world-beater, for its lines are elegant even by de Havilland standards.

Drawing on Vickers' experience with the "Nene-Viking" and "Viscount," its designers have kept the 36 passenger seats forward of the exhausts from its four giant "Ghost" engines, to reduce noise level to a minimum for all passengers. Although this has resulted in the passenger windows being placed over the wing, it does not matter very much in the case of the "Comet," as it will cruise at 40,000 ft., from where there would be little chance of seeing the ground anyway.

It will naturally be some time before the 14 "Comets" ordered for B.O.A.C. and B.S.A.A. are in passenger service, but de Havillands can be relied upon to keep delays to a minimum. Meanwhile, B.O.A.C.'s Chairman, Sir Miles Thomas, left no doubt of his views on the subject when he said recently that "the 'Comet' represents a notable milestone in the progress of British civil aviation. Flying at 400 m.p.h. or so over Commonwealth routes before she tackles the longer trans-atlantic stages," he continued, "the 'Comet' will blaze a new trail of glory. It should make the world seem a very shrunken globe."

Even more important, it should help to shrink the financial losses being made by our nationalized airlines, for in spite of its tremendous power, and consequent heavy fuel consumption, the "Comet" is definitely a sound business proposition. High power results in high speed, and high speed will enable it to fly more miles per year than a piston-engined transport, and so carry more ton-miles of payload in that period. In addition, jet-engines require much less maintenance than piston-engines, while their lack of vibration also reduces considerably wear and tear on the airframe, so that airframe maintenance too can be reduced. All this means big savings in overhead expenses.

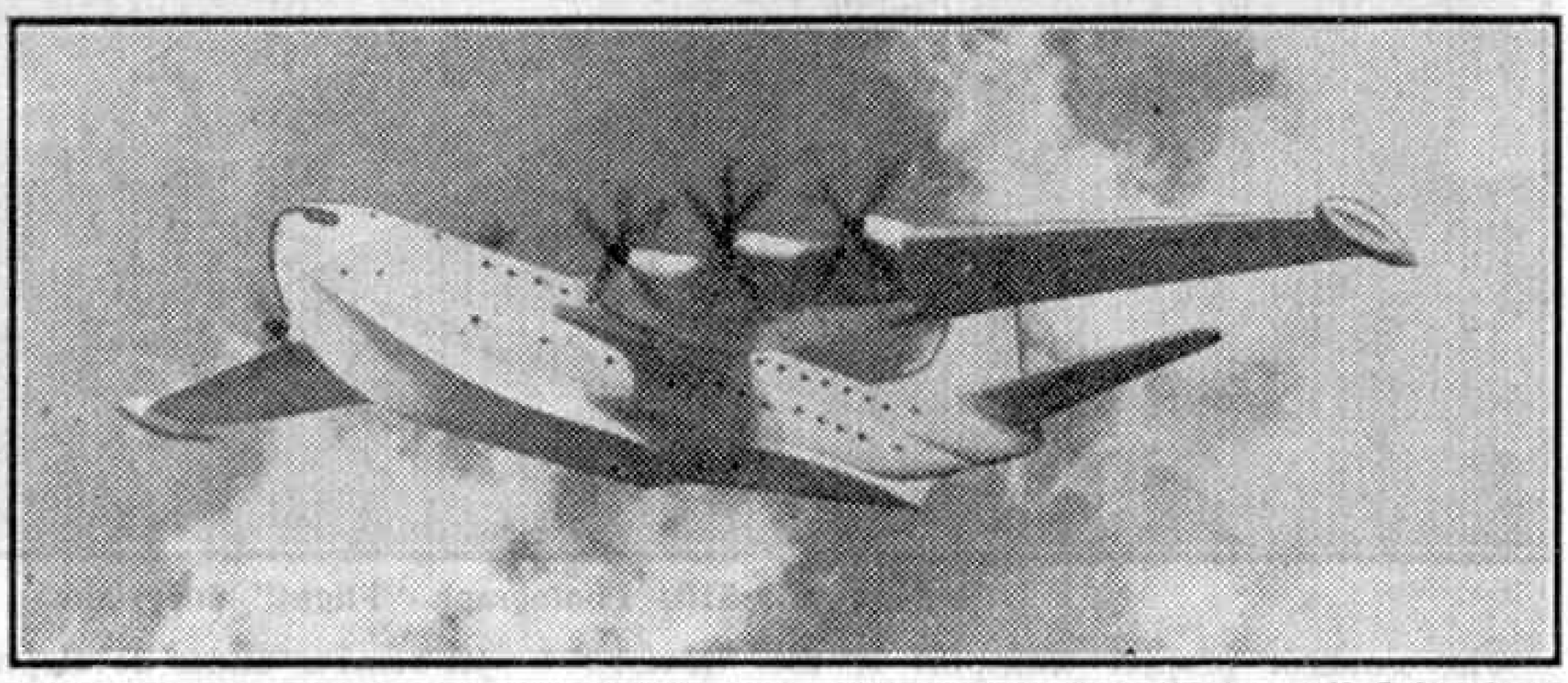
**Illustrated above is the de Havilland "Comet," the world's first real pure-jet air liner. Photograph by courtesy of de Havilland Enterprise.**

Some interesting facts on this question of economy were given recently by George Edwards, designer of the "Viscount." He said that, from the point of view of fuel, payload and cost per ton-mile, on ranges of up to 1,000 miles, propjet air liners are at least as economical as comparable

piston-engined types. Pure-jet aircraft, however, are useless over short distances as they would have to carry such enormous fuel reserves, to cater for "stacking" over their destination or diversion to an alternative airfield in bad weather, that they would be able to carry no payload. Over longer ranges, there is little to choose between jets and propjets from the point of view of economy, but both are far superior to piston-engines.

As Britain has both reliable jets and propjets, we can "pay our money and take our choice". This gives us a great advantage over American designers, for although Pratt and Whitney are building the Rolls-Royce "Tay," one of our best pure jets, under licence in the United States, the Americans have no satisfactory propjets. The reason for this is probably that they have had so much vibration trouble with their latest square-tipped, hollow-blade propellers that they are suspicious of any engine with a propeller on the front. Anyway, the Americans have no propjet air liners flying, whereas we have four—the Vickers "Viscount," Armstrong Whitworth "Apollo," Handley Page "Hermes" V and Handley Page (Miles) "Marathon" 2.

This too is a matter of great rejoicing for our aircraft industry, for these aircraft, together with the magnificent 100-passenger Saunders-Roe "Princess" flying boats and the Bristol "Brabazon" 2 landplanes now under construction at Cowes and Filton, ensure that Britain will have jet air liners suitable for every type of airline service.

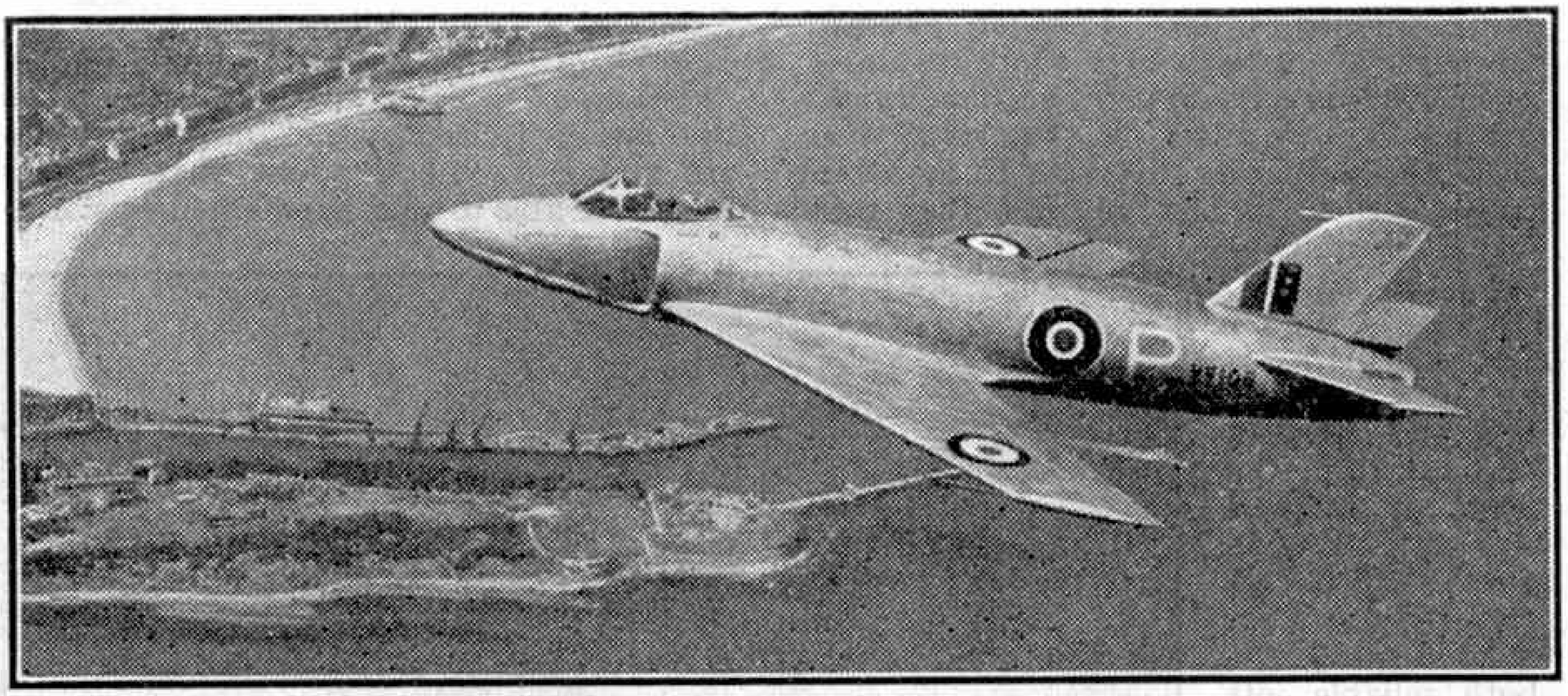


**An impression of the magnificent 100-passenger Saunders-Roe "Princess" flying boat, the prototype of which will fly in 1951. Photograph by courtesy of Saunders-Roe Ltd.**

Several foreign airlines may follow the example of B.E.A. and B.O.A.C., and order "Viscounts," which is hardly surprising as the latest Rolls-Royce "Dart" propjets are giving so much power that Vickers have been able to offer an enlarged version—the "Viscount" 700—with accommodation for up to 53 passengers. When one considers that four "Darts" cost little more than two "Centaurus" piston-engines, which give about the same power; that the propjet gives a smoother and faster ride at no extra cost; and that it uses kerosene, which is both cheaper and much safer than petrol, the reason for all the enthusiasm is apparent.

The "Apollo," which is in the same class as the "Viscount," offers a high degree of versatility. To start with, it will be available in seven versions, including an executive travel type complete with conference room and stateroom, normal 24-45 seat passenger air liners, a freighter with a 5-ton payload, military ambulance with accommodation for 20 stretchers and four attendants, and paratroop transport able to carry 45 fully-equipped soldiers. Furthermore, each version can be fitted with either "Mamba" propjets or "Merlin" or "Wasp" piston-engines.

**Armstrong Whitworth "Apollo," Britain's second propjet transport. Photograph by courtesy of Sir W. G. Armstrong Whitworth Aircraft Ltd.**



**Supermarine 510. Photograph "Flight" Copyright.**

The smallest propjet transport is the "Mamba-Marathon," which is a twin, unlike the standard "Marathon" I ordered for B.E.A., which has four "Gipsy Queen" piston-engines. As each "Mamba" gives over 1,000 h.p., it has available some 640 h.p. more than the standard type, giving it a cruising speed of 260 m.p.h.—roughly double the speed of air liners at present in service on our internal air routes. What is more, as the "Mambas" weigh 1,000 lb. less than the "Gipsy Queens," enough fuel can be carried for an extra 200 miles range.

At the other end of the size scale is the "Hermes" V, powered by four "Theseus" propjets. At present, it is intended purely as an experimental aircraft, but it is basically similar to the piston-engined Mark IV, 25 of which will soon be in service with B.O.A.C. This adds significance to a recent Handley Page statement that it would be comparatively easy to convert all "Hermes" IVs into Mark Vs if flight tests showed that benefits to be derived outweigh the cost and trouble of conversion. As the "Hermes" V promises to cruise 50 m.p.h. faster than the Mark IV, and, because of the low weight of its "Theseus" engines, could carry an extra ton of payload, we may well see much more of it.

Side-by-side with these fine civil aircraft, British designers have developed new jet fighters and bombers second to none in the world. Pride of place must go to the English Electric A.1, because it is the first of our anxiously-awaited jet-bombers. At first glance it looks a little disappointing, lacking advanced features such as swept wings and buried engines that many people expected. But looks are often deceptive, and one should not forget that there are some 7,000 lb. of thrust packed into each of its two "Avon" engine nacelles, while its sleek fuselage is big enough to hold a very formidable bomb load. Anyway, it is already in production, and the fact that it is to be named "Canberra" seems to indicate that assembly lines may not be restricted to this country.

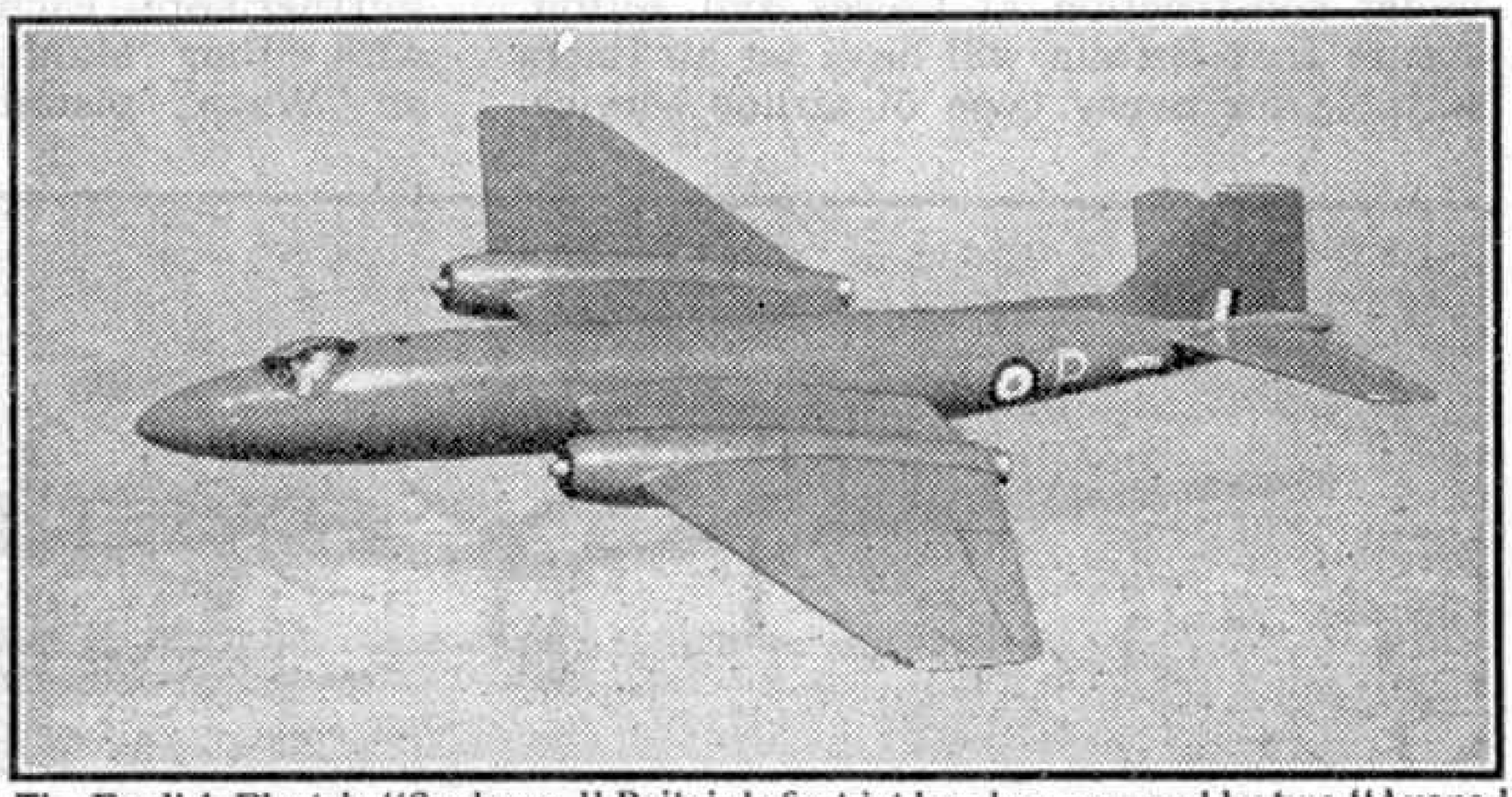
What is more, those people who want something less orthodox may not have long to wait, for it is by no means the only jet-bomber under development in Britain!

Meanwhile, we are easily maintaining our traditional lead in fighter design, as was proved when the veil of secrecy was lifted from *some* of our new prototypes at the S.B.A.C. Show last month.

Like all old soldiers, it seems that the "Meteor" and "Vampire" will never die, for the latest versions of both aircraft at Farnborough looked by no means out of place among newer designs. As more powerful engines have come along, Gloster and de Havilland have simply modified the airframes to house them, without any apparent trouble. Thus the "Meteor" design has advanced from two 1,700 lb. "Wellands" to the stage where it is now flying with two 7,000 lb. "Avons," the most powerful aero-engines in the world. When one realizes that the "Beryl-Meteor" has been known to climb 7½ miles in as many minutes, it is obvious that the "Avon-Meteor" must have a truly phenomenal rate of climb.

The same must be true of the de Havilland "Venom," which is basically our old friend the "Vampire" with thin wings and a "Ghost" engine. No hint of its performance may yet be given, but it looks very much like the world's finest high-altitude jet-fighter.

No less important is another variant of the "Vampire," the "Goblin" powered D.H. 113 night-fighter, which also made its debut at Farnborough. It is the first of our two-seat jet night-fighters and, like the "Canberra," has been eagerly awaited, for there has been repeated criticism of our night defences. Much of this criticism is unjustified, (*Continued on page 389*)

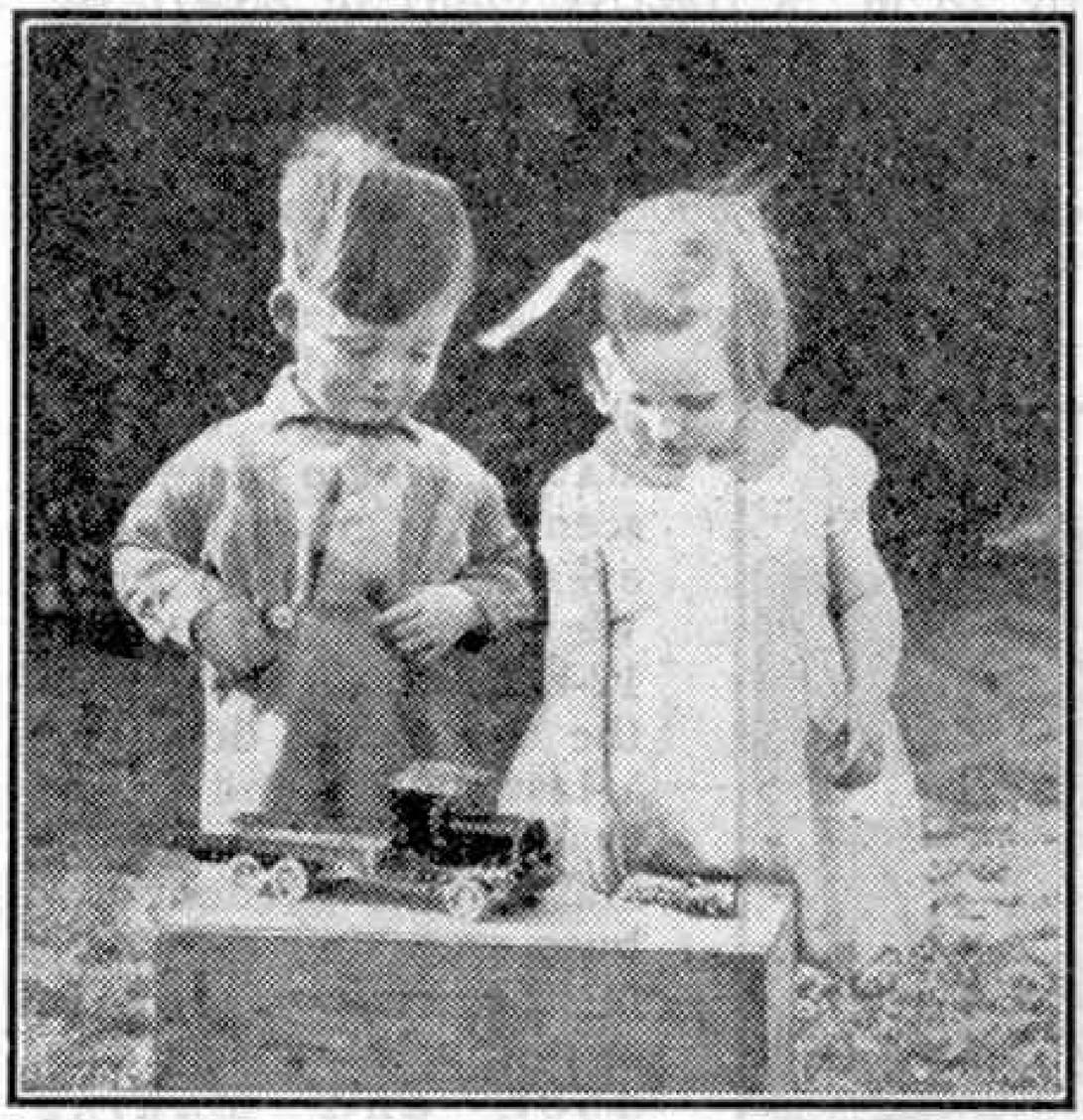


**The English Electric "Canberra," Britain's first jet bomber, powered by two "Avons." Photograph by courtesy of English Electric Co. Ltd.**

# Photography

## Gaslight Printing Hints

IT is always exciting to collect a wallet of new prints from the chemist or photographic dealer who has made them, but it is much more fun to make one's own prints, and have the thrill of seeing the picture appear on the paper as this lies in the dish of developer. Making gaslight prints is quite easy, and if the instructions packed with the paper are followed no trouble should arise. Nevertheless, as our correspondence shows,



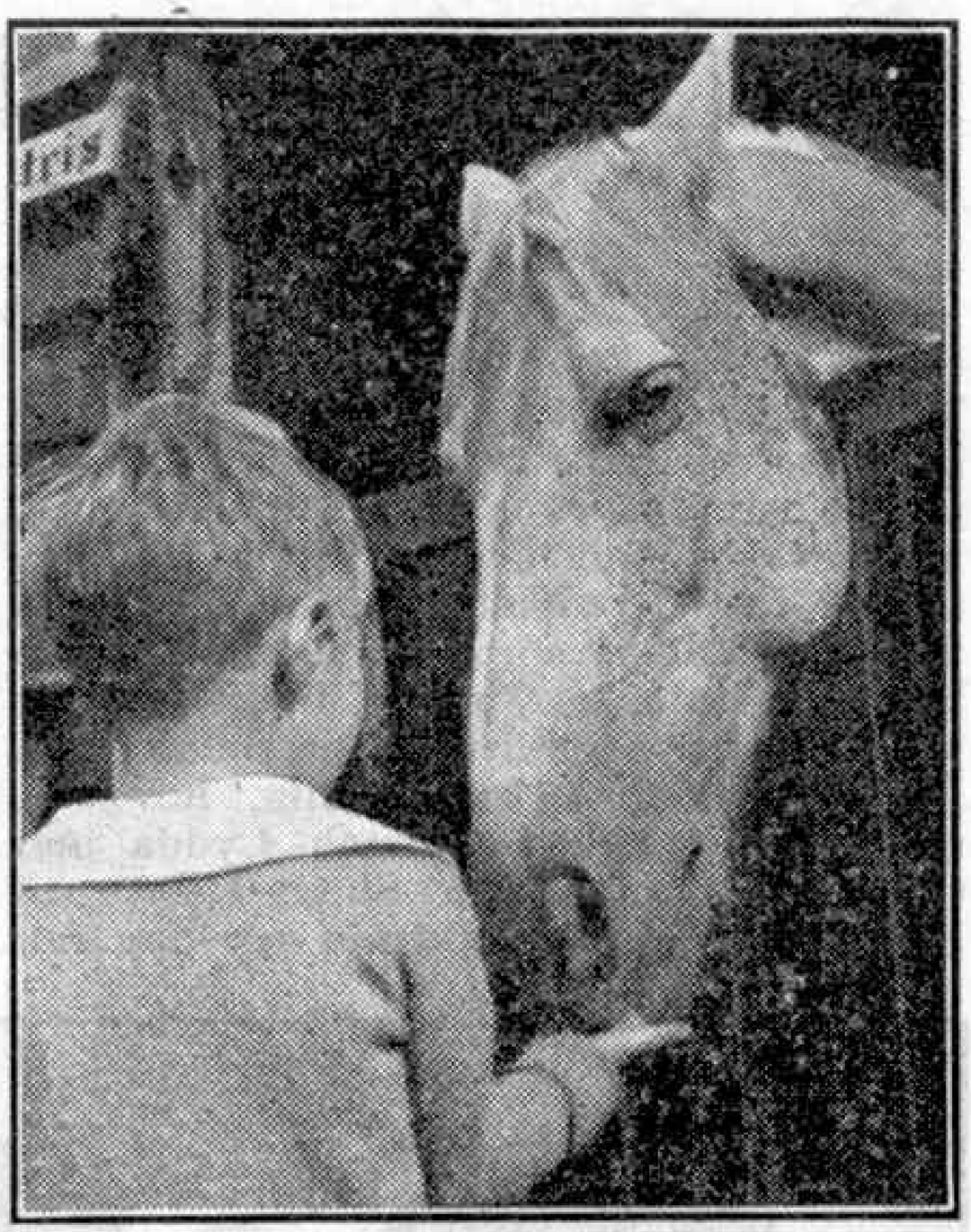
**A dual display. Photograph by L. Humm, Geraldine, New Zealand.**

failures do occur, and in this article I propose to give a few hints that may be helpful.

The commonest trouble is that of stains appearing on the prints. This may arise from various causes, among which is stale or overworked developer. The developer should be regarded with suspicion when it begins to turn brown, and if possible new solution should be put into use. Another sign that the developer is losing its effectiveness is that the blue-black colour of the prints begins to acquire a greenish tinge.

All readers who have developed prints will have noticed that there is always a slight reluctance on the part of the developer to flow quickly and evenly over the whole surface of the print, so that, unless the dish is actively tilted, development of the whole print will not begin at exactly the same moment. This trouble can be overcome by the addition of a small quantity of what is known as a wetting agent. How these mysterious agents work I do not know, but their effect is to ensure that the liquid flows instantly and freely over the surface of the gaslight paper. The Johnson "326" liquid wetting agent, or the Burroughs Wellcome wetting agent in "Tabloid" form, are excellent for the purpose.

It is a good plan to add a wetting agent to the last lot of water that is used in washing prints, in order to make the water run evenly off the surface of the prints.



**"Morning Snack." Photograph by P. W. Lang, Sevenoaks.**

I have recently found another mysterious liquid known as Johnson "142" of distinct advantage. When added to developing solution for gaslight prints, it prevents staining from whatever cause. It is particularly useful with gaslight paper that has been kept a long time and is becoming rather elderly.

The Johnson "Universal" liquid developer is very useful for making gaslight prints, as it contains a suitable proportion of the Johnson "326" and "142."

As regards fixing, use one of the commercial acid-hypo solutions, see that each print is fully immersed when you put it into the dish, and move it about from time to time. Prints lying still on top of one another on the bottom of the dish cannot fix properly. I use an old wooden paper knife for moving the prints about; this prevents my getting hypo on my fingers and having to wash them before proceeding with printing.

**"Forty Winks." Photograph by R. Atkins Eccles.**

# On the Footplate in Palestine

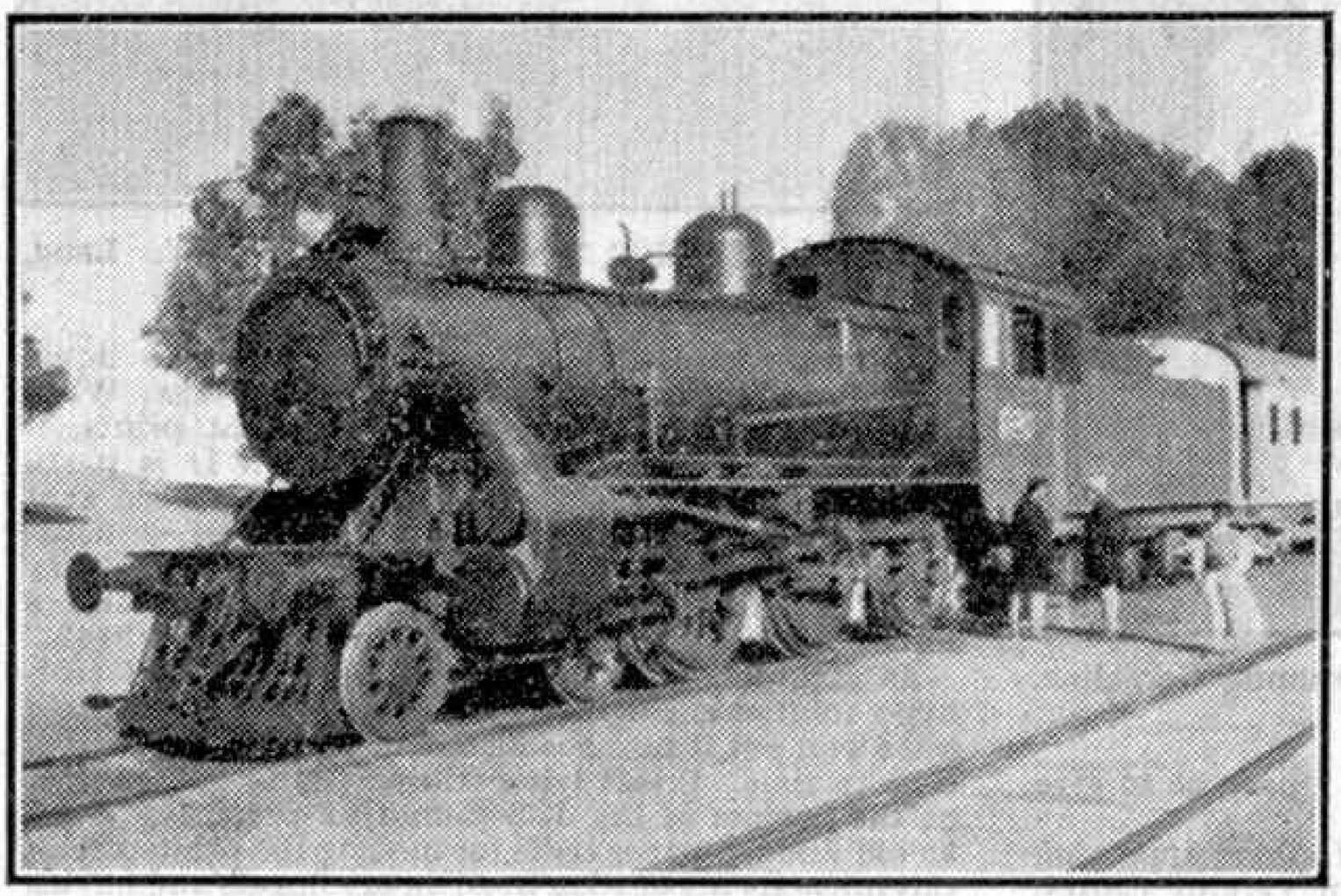
## Impressions of a Desert Journey

By D. Stewart Currie, G.I.Mech.E., G.I.Loco.E.

IF you look at a map of Palestine you will see that the railway system consists of one main line running North and South, and several branch lines. From Haifa, a line that was completed during the recent war leads to the north. This line forms a through route to Turkey, but since the war there has been little or no traffic on it.

The main line from Haifa, however, runs to the South, through Lydda and Gaza, then over the Sinai Desert to Egypt. One passenger train per day ran between Haifa and Cairo during the British Mandate, and this conveyed both military personnel and civilians. The train left Haifa early each morning, and was due into Cairo about midnight. It was timed so that the Palestine part of the run was done in daylight, in order to minimize the risk of attack by the Irgun Zvai Leumi and the Stern Gang, but in spite of this the train was blown up on several occasions by mines detonated electrically or by contact with the wheels.

Such were the conditions when, one morning, I climbed aboard engine No. 891 at Haifa shed ready for the trip South. This locomotive could not be called modern as she had been built by the Baldwin Locomotive Works, U.S.A., in 1918. Still she was in good condition, and looked fine with the early morning sun glistening on her black paintwork. Her wheels have a diameter of 5 ft. 6¾ in. and the boiler pressure is 190 lb. per square inch. She has two outside cylinders 20½ in. by 28 in., a tractive effort of 28,470 lb., and a water capacity of 6,500 gallons carried in an eight-wheeled bogie tender. The fuel oil, known locally as mazout, is carried in a 1,500-gallon tank mounted on the tender.



**Palestine Railways 4-6-0 No. 880, on which the author rode. The driver is standing next to the cab.**

It was just on 5.30 a.m. when we came "off the shed" and ran slowly down to the station, where there were scenes of great activity even at that early hour. We backed on to a 12-coach train and Abdul the driver got down for a last look round to see that all was in order. Hassan the fireman was busy watching the flame in the fire-box through a peephole in the fire-door, and making adjustments to it by varying the amount of oil or steam to the burner.

Back along the platform I could see the usual bedlam of a Middle East station. Dozens of small urchins were attempting to sell anything from Coca-Cola to watches to troops in the train, while other individuals in flowing robes, which had once been white, were carrying large quantities of baggage to the luggage van, under the extremely wary eyes of the owners. At length everything appeared to be ready, and Abdul took up his position at the regulator. The guard blew his whistle, and we slowly moved off on our journey.

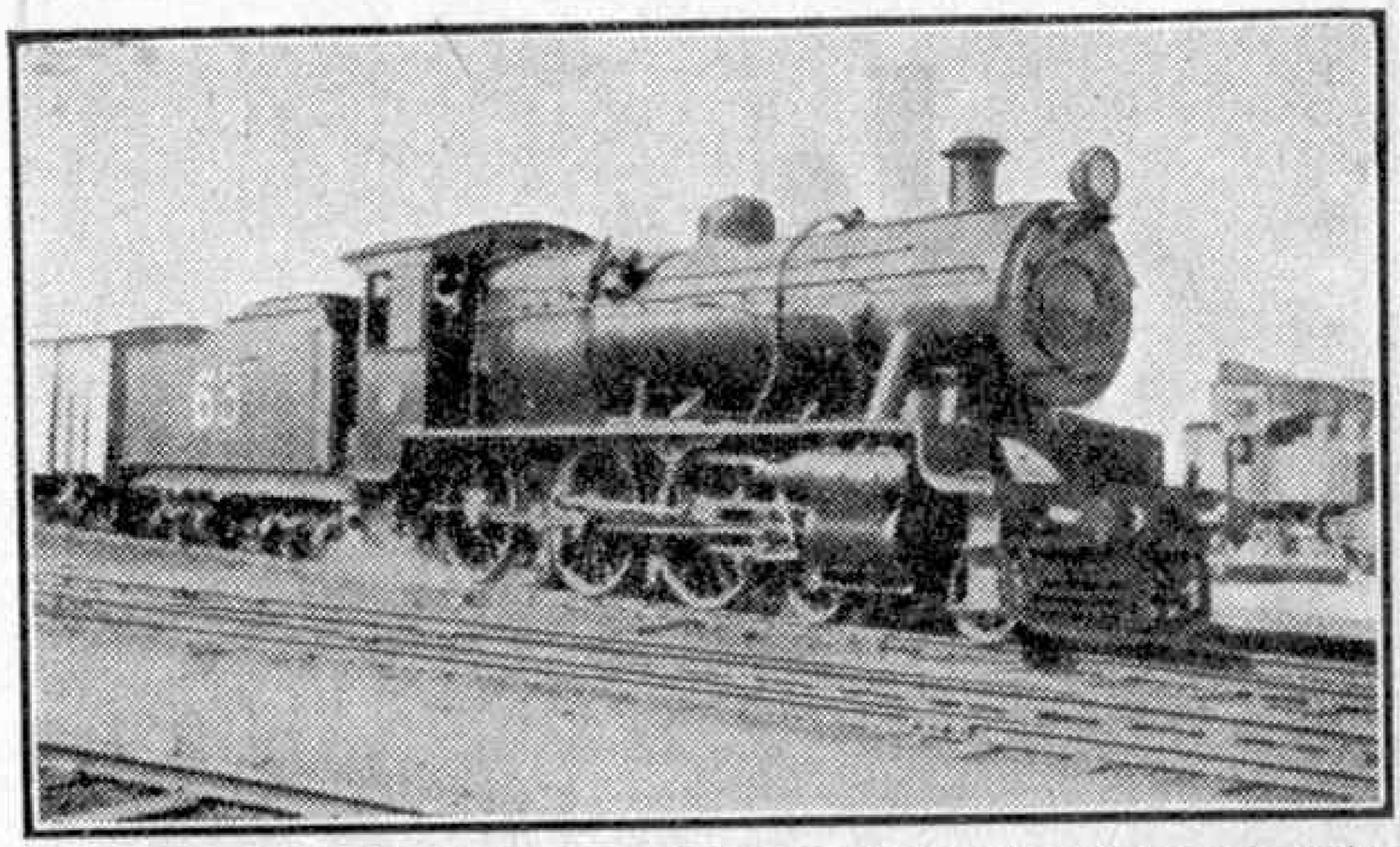
Hassan busied himself with the fire, and the roar of the oil burner increased considerably. We travelled slowly alongside the Mediterranean, past the wreck of an illegal Jewish immigrant ship which lay on the rocks, and as we cleared the suburbs under the shadow of Mount Carmel we began to gather speed. Ahead

of us lay the Biblical Plain of Sharon, while to the east were high mountains beyond which lay the River Jordan. We had several short stops at wayside stations, such as Atlit, Zikhron Ya'acov, Hadera, and Ras El Ain, and at each place a large percentage of the population was waiting, either out of curiosity or in an attempt to sell Jaffa oranges, dates, Turkish delight, or peanuts to the passengers.

Speed was obviously not essential on this trip and we jogged steadily along, taking just under three hours for the 110 kilometres between Haifa and Lydda. We came to a stand at the latter, a busy junction, just before 9 a.m., and here I said farewell to my two friends Abdul and Hassan, who took No. 891 to the shed to get ready for the return journey to Haifa. Another locomotive of the same class, No. 880, now came on for the run of 303 kilometres to Kantara on the banks of the Suez Canal. I soon made friends with the new crew, who introduced themselves as Mohammed, the driver, and Abdou, the fireman. While we were standing in the station a small youth made his appearance carrying an enormous basket which he handed to Mohammed. It contained a large quantity of Jaffa oranges, and I gathered from Abdou that this was Mohammed junior.

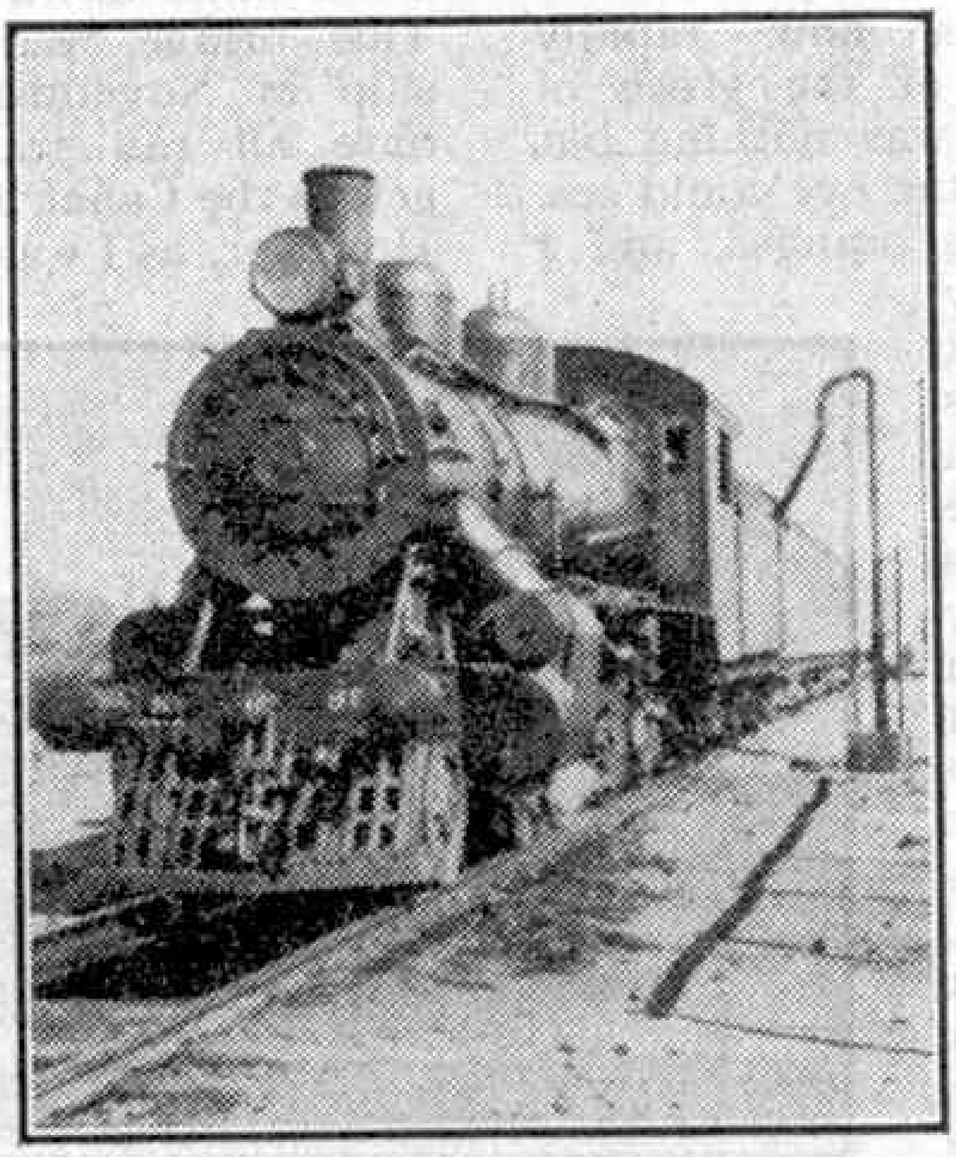
At another platform I could see a large tank engine standing so I asked Mohammed where it was going. He told me it was taking the Jerusalem train and that the locomotive had to be "*plenty strong*" to get up the hills to Jerusalem. As this train was timed to do the 66 kilometres between Lydda and the Holy City in two hours and ten minutes, one can guess what the gradients were like.

After a half-hour halt at Lydda we got the road and Mohammed gently opened the regulator. We moved slowly off through the orange groves, with the lovely smell of the orange blossom penetrating even into the oily atmosphere on the footplate. We quickly picked up speed, only to brake again after passing Beer Ya'acov for a permanent way restriction. This had been caused by a passenger train being derailed a few days previously by Jewish Terrorists, and as we passed the spot I saw the wreckage of several coaches lying on the lineside. Then once again we were off, with Abdou saying something in Arabic about terrorists, which I gathered was not very complimentary.



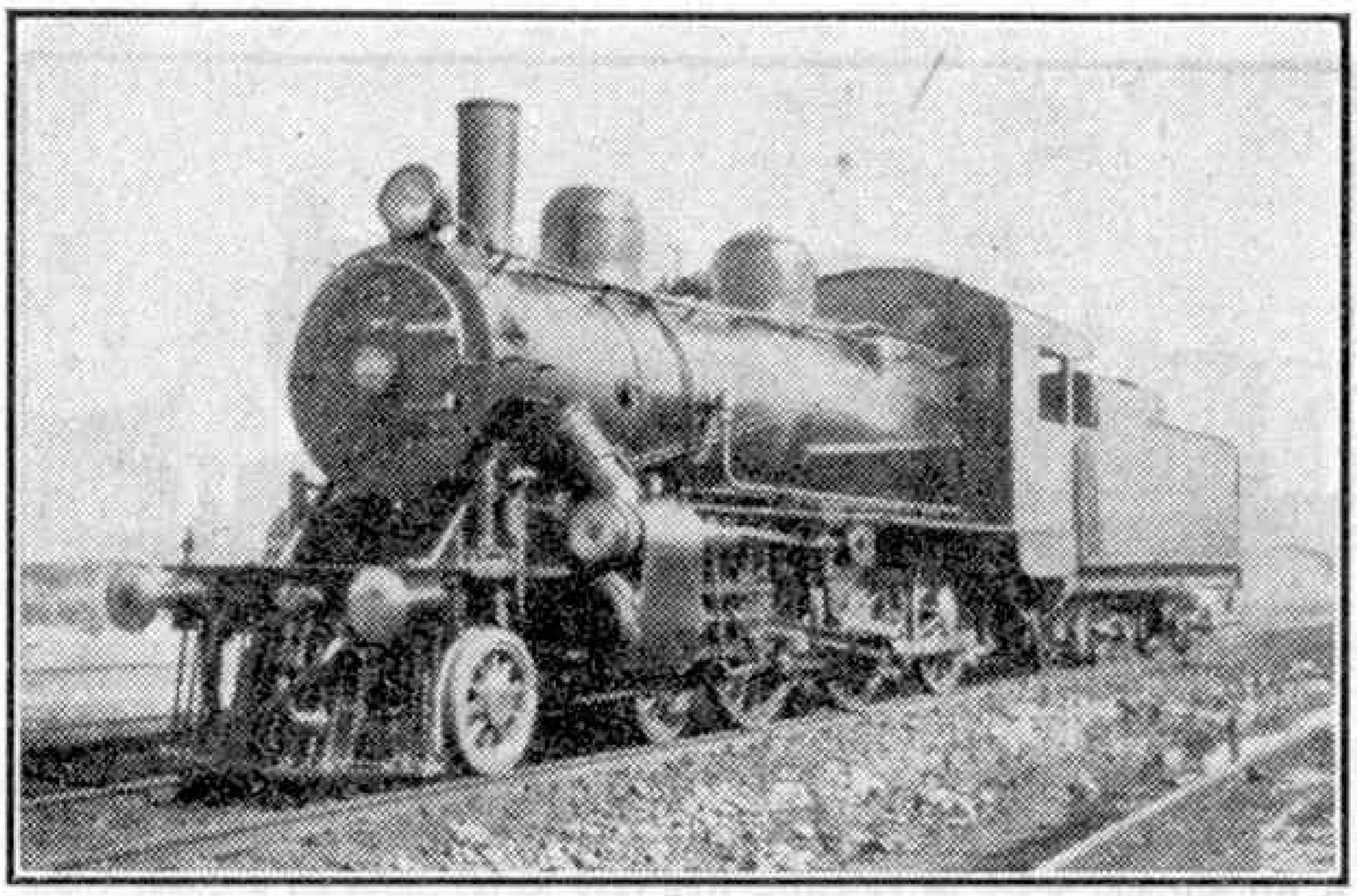
**A British-built 4-6-0 of Palestine Railways leaves Jaffa on a goods train.**

Mohammed was obviously anxious to show me what his engine could do, and just north of Gaza he opened her out until we were doing over 70 k.p.h., which was very fast by his standards. But that did not last long, and soon we were rolling gently to a halt beside the water column at Gaza, about five minutes ahead of time. We all descended, and I took the opportunity of going back along the train to the restaurant car for a meal, while the engine took water. The dining car was owned and staffed by the "Compagnie



**No. 880 on the Haifa to Cairo express taking water at Gaza.**

Internationale des Wagons Lits" and I was served with an excellent lunch by a dusky Arab waiter, dressed in a spotless white robe which reached to his ankles, and wearing a fez. As the train stood at



**Palestine Railways No. 902 of the same class as No. 880 referred to in this article. Apart from the buffers and screw couplings it has a typical American appearance.**

Gaza for only 40 minutes, I had to hurry, and soon I was back again on the engine.

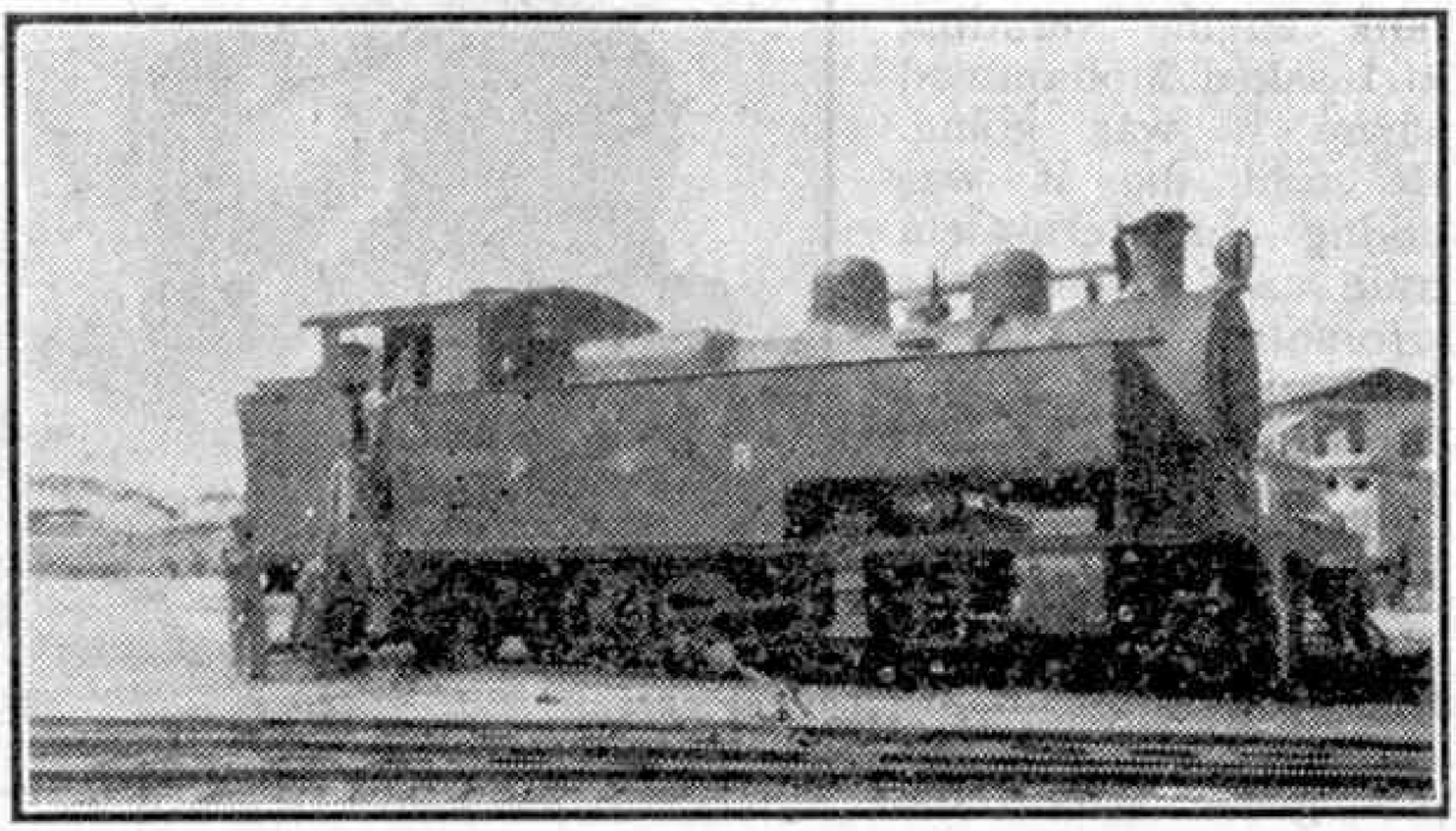
At midday we left Gaza, on the first part of our run across the desert, and as we passed a small dome-shaped tomb by the lineside Mohammed pointed to it, and thumping his chest with his fist said *"Samson."* Later I made enquiries, and found that it was actually the tomb where Samson is believed to be buried.

The countryside was now rapidly changing, and in place of the green of the orange groves there was nothing but sand stretching as far as the eye could see. Mohammed produced the oranges, and I found them extremely refreshing, as the dust was now rising in clouds from the wheels. When I looked back along the train the rear coaches appeared to be practically enveloped in a brown haze, and I wondered how the occupants were faring.

So we continued at a steady 45 k.p.h. to Rafah, which was the Egyptian frontier. Abdou kept a close watch on his fire all the time, and was constantly turning wheels and peering into the fire-box. About once every hour he took a large scoopful of sand from a container, and as Mohammed opened his regulator to its fullest extent, Abdou let the sand be drawn into the fire-box through the peephole in order to clean the tubes.

The run across the Sinai Desert was not very interesting, and we had several stops, including half an hour at Mazar to take water. Speeds were not high and the average was about 40 k.p.h. My eyes grew tired with the constant glare from the sand, and when at last Abdou pointed ahead and said *"Kantara, Effendi"* I looked at my watch and saw that it was 5.25 p.m. We slowly passed Kantara East Cabin, then the Depot, finally coming to rest in the Dock Platform of Kantara East Station.

At this point the train was reversed, and as we stood in the station we saw the Egyptian State 4–4–2 No. 56 *"King Fouad"* backing down on to the other end. This engine, with its unusual nameplate, was illustrated in the *"M.M."* in November 1947. She would be in charge for the last lap of the run to Cairo, crossing the Suez Canal by the El Firdan swing bridge, a few miles down the canal from Kantara. This bridge was damaged by a Dutch ship in November 1947, and since that date all rail traffic has been conveyed across the Canal by two ferries at Kantara. However, as I was not (*Continued on page 389*)



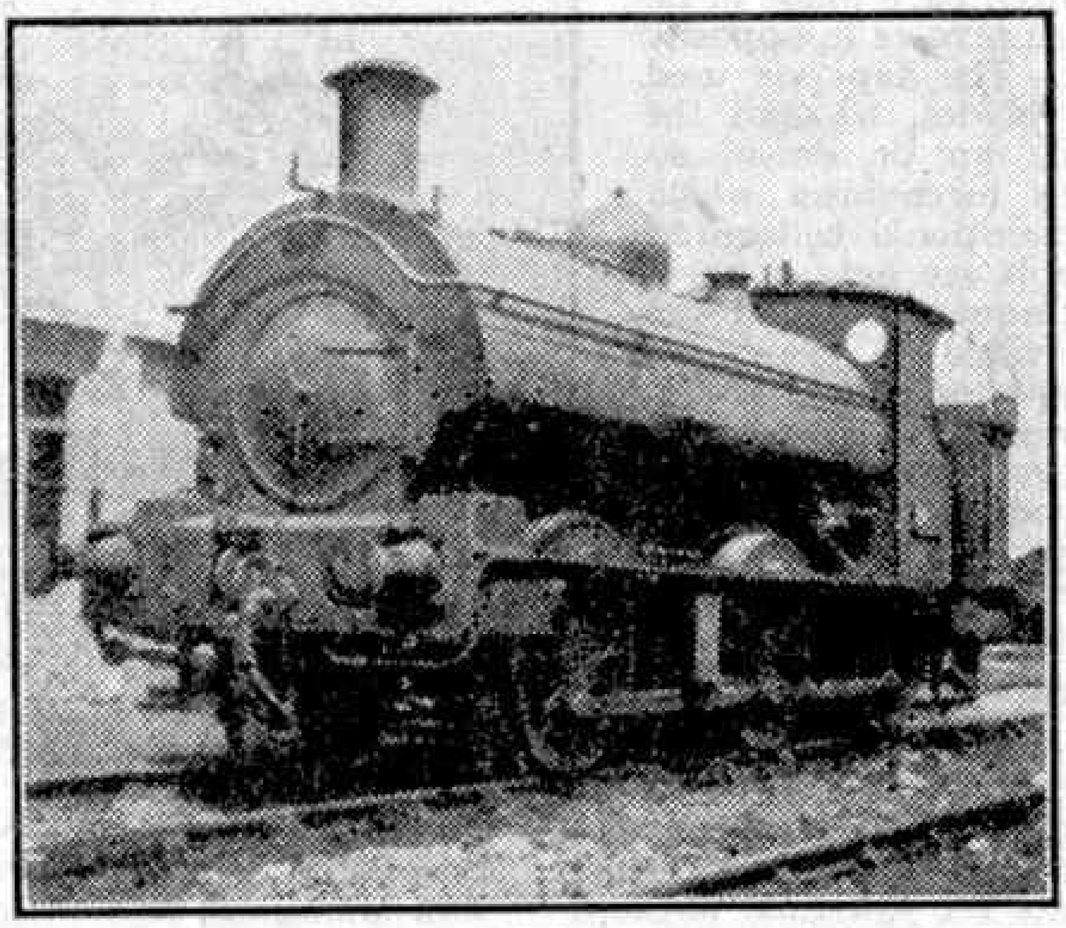
**A big Palestine Railways tank locomotive at Jaffa. The engine is a 2-8-4, conspicuous for the cut-away shape of the side tanks.**

**Ice-cream by the Ton!**—(*Continued from page 378*)

the wheel does not receive its piece of wrapping paper, no brickette is fed to it; similarly, if a pocket on the final conveyor does not contain a group of six brickettes, no wrapping paper is taken from the magazine at that point.

The making of choc-bars is perhaps the most remarkable process in the whole factory, for it involves the coating of frozen ice-cream brickettes with hot melted chocolate! Hardened ribbons of cream are fed to the vertical columns at one end of the machine, and are cut off by horizontal guillotine cutters. The cut sections fall on a belt, which slowly carries them to a part of the machine called the "enrober." Here they pass under a shield, and are immediately drenched with melted chocolate which is falling in a continuous curtain.

It would seem that in this operation the ice cream would be melted at once, but it is not. Instead it receives an even chocolate coating, and then passes out along a further conveyor that takes it to the wrapping machines. The secret of the process is that the bars are on conveyors that are kept at freezing temperature right up to the point where the chocolate falls on them, and also immediately afterwards. This not only keeps the ice-cream frozen, but also cools the chocolate very rapidly and sets it. At the end of the coating machine, the bars are transferred to a machine that wraps them in tin foil, and they are afterwards again packed in groups and sent to the store rooms.



**Engine No. 1925, one of the two surviving 0-6-0T of G.W.R. origin with round-topped saddle tanks. It was built at Wolverhampton in 1884. This photograph, by A. R. Brown, Isleworth, won a prize in the January 1949 "M.M." Photographic Competition.**

**On the Footplate in Palestine**—

(*Continued from page 388*)

travelling further, I saw No. 56 steam out, and then I said good-bye to my two companions who had made my trip so interesting.

As I crossed the Canal a few minutes later I caught my last glimpse of No. 880, with Mohammed and Abdou looking out of the cab, as she slowly ran back to the shed for a well-earned rest after a hard day's work.

**New British Jets**—(*Continued from page 384*)

for Fighter Command's present "Meteors," "Vampires," "Hornets" and "Mosquitoes" are unmatched for efficiency. But it is good to know that we have a new generation of day and night fighters in existence to carry on the good work.

In these days of jet-bombers and atom-bombs, the ability to "get upstairs" quickly is a primary requirement for jet-fighters, but this demands enormous power. Unfortunately, once the fighter is at its operating altitude, high power is a decided drawback until the enemy is engaged, as it burns up fuel at an alarming rate. To get over the trouble, designers in both Britain and America are now resorting to the use of after-burners, which at first were tried out on a "Meteor" as long ago as 1944, and both a "Meteor" and a "Vampire" with after-burners were demonstrated at Farnborough.

What happens, in simple terms, is that fuel is injected into the exhaust gases in the jet tail-pipe, and burned there at extremely high temperatures. The terrific heat energy created provides greatly increased thrust, although at the cost of fantastic fuel consumption. But the after-burner need be used only for take-off and in combat, enabling the fighter to cruise on the comparatively low power of its jet-engines during normal flight. After-burners can, in fact, double the power of jet-engines for short periods, for an addition of only 20 per cent. to the weight of the engine installation.

As well as these new versions of the "Vampire" and "Meteor," we have the fine Hawker N7/46 and Supermarine "Attacker" fighters, with their swept-wing counterparts, the P1052 and Model 510 respectively, and new versions of the Westland "Wyvern" strike-fighter fitted with Rolls-Royce "Clyde" and Armstrong-Siddeley "Python" propjets. The "Attacker" and "Python-Wyvern" are already in production for the Royal Navy, and there are persistent rumours that the P1052 will be built in Australia for the R.A.A.F.

Perhaps the most amazing fact of all is that almost every new British aircraft mentioned in this article has made its first flight within the last six months. There is little reason to suppose that the next six months will prove any less exciting.

## A SCOTTISH LOCOMOTIVE SOCIETY

A new organisation for students of locomotive design and performance, with headquarters in Glasgow, is being formed under the title "*Scottish Society of Students of the Locomotive.*" The founders are satisfied that this Society will fill a gap in the serious study of the locomotive not at present provided for by any other organisation.

The Acting Secretary is Mr. R. C. Menzies, 3, Victoria Park Drive South, Glasgow W.4.

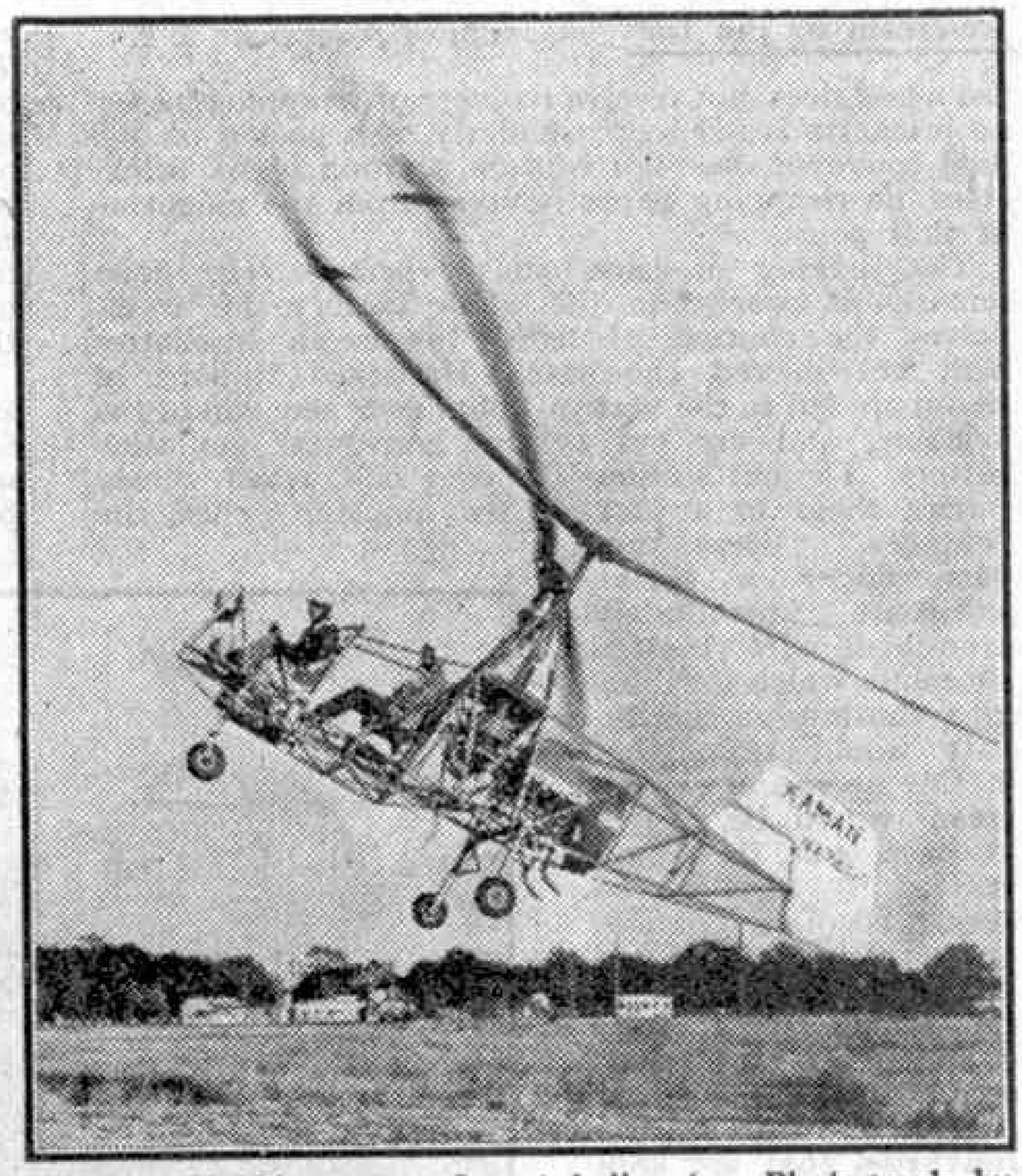
## A METAL OF THE FUTURE

Some day supplies of such metals as lead, tin, zinc and copper will run out, especially if we have more "scientific" wars like the last one, in which enormous quantities of these and other metals were used up. Fortunately there are other metals that so far have not been needed, and in the years to come some of these may become better known to us. This has already happened with aluminium and magnesium. Another metal that at present is well behind these in the queue for exploitation is titanium. This is unfamiliar to us, not because of its scarcity—titanium is more plentiful in the Earth's crust than either lead or tin—but because it cannot so easily be extracted from its ores.

Titanium has been recognized as an element for more than 150 years, but until comparatively recently no particular use had been found for it, and it was of interest only to chemists. Then it was discovered that titanium oxide, a combination of the metal with the oxygen of the air, could be made into a splendid white paint that is outstanding for its covering power. Interest in the metal grew further when it was found that mechanically it was similar to stainless steel, although it is much lighter, and there are hopes that its alloys will be as superior to the metal itself as steel is to iron.

# Air News

By John W. R. Taylor



Kaman K-190, a new 3-seat helicopter. Photograph by courtesy of Kaman Aircraft Corporation, U.S.A.

### Another New Helicopter

The Kaman K–190, illustrated on this page, is certainly not the most handsome helicopter ever built, but its makers claim that it is the most manœuvrable and easiest to fly. Judging from newsreel films of it shown in this country, they are probably right.

Secret of the K–190's success is the novel servo-control flap fitted near the tip of each blade of its two intermeshing rotors, which revolve in opposite directions like an egg-beater. The flaps are used to control the pitch of the blades, to send the machine forward, backward, up or down, so dispensing with the complex mechanism which controls the blades of a conventional helicopter. As a result, the pilot's controls are lighter, there is no need for a tail anti-torque rotor and the aircraft is unusually manœuvrable.

The K–190 is a 3-seater, powered by a 190 h.p. Lycoming engine, which gives it a top speed of 85 m.p.h. Production this year will be limited to about 20 aircraft, intended mainly for crop-spraying work, and costing £6,250 each. By next year, however, Kaman hope to reduce the price by half.

### R.A.F. Re-Equipment Overseas

Considerable progress has been made with the re-equipment of R.A.F. squadrons overseas. Jet aircraft have replaced piston-engined types in a number of squadrons, while various other units are receiving modern replacements for war-time aircraft.

Three fighter squadrons in Germany now have de Havilland "Vampire" 5 jet fighters, and squadrons in Malta and Cyprus have the "Vampire" 3. The R.A.F.'S new light tactical bomber, the Bristol "Brigand," is in service in Iraq, at Aden and Kuala Lumpur, and a meteorological flight of "Brigands" has been formed at Negombo, Ceylon.

As part of the complete re-equipment of Transport Command, five "Dakota" squadrons in the Middle East will receive Vickers "Valetta" medium-range transports by the end of the year.

### Pan American Anniversary

When Pan American World Airways Flight 100 took off from New York for London on 28th June last it completed 10 years of regular transatlantic passenger service. The first passenger flight, with 22 passengers aboard the "*Dixie Clipper*," took off from Port Washington, Long Island, on 28th June, 1939, and landed on the Tagus River, Lisbon, just under 24 hrs. later, reaching Marseilles the next day.

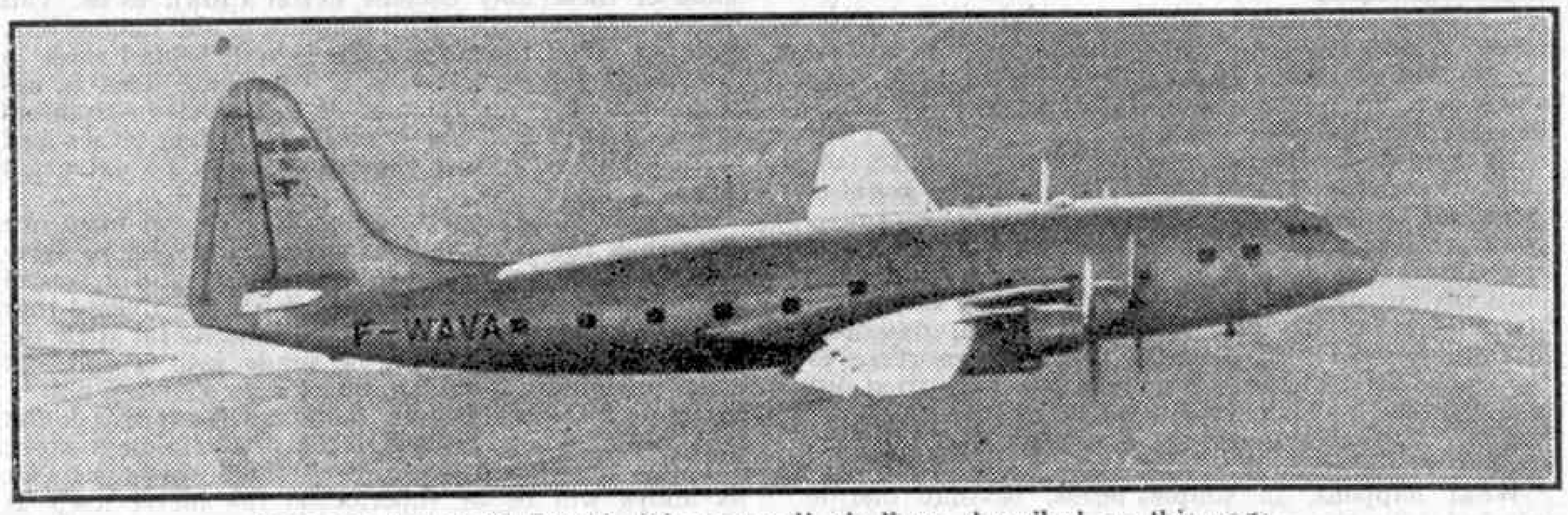
In the 10 years following that inaugural flight, P.A.A. flew over one billion passenger miles, carrying 413,148 people between New York and London, Lisbon, Barcelona, Vienna, Frankfurt, Shannon, Brussels and Marseilles, and on to Calcutta and Johannesburg.

### Giant French Air Liner

The Aerosudest SE 2010 "Armagnac" air liner, illustrated at the foot of this page, provides striking proof of the progress made by French designers since the end of the war. It is by far the largest Continental landplane yet flown, with accommodation for 98 passengers and a loaded weight of 75 tons, ten tons more than the well-known Boeing "Stratocruiser." Like that American air liner, it has four 3,500 h.p. Pratt and Whitney "Wasp Major" engines, which give it a top speed of 335 m.p.h. and a range of 2,470 miles at 276 m.p.h. with full load. A total of 25 "Armagnacs" are on order for Air France.

### Jet-Powered B-36

To improve take-off and combat performance, the giant American Convair B–36 bomber is now being fitted with two jet-engines under each wing-tip, giving it a total of ten engines, developing 21,000 h.p. plus 20,000 lb. of jet-thrust. The four General Electric J.47 jets are mounted on "stalks" in the same way as the engines of the Boeing B-47 jet bomber.




The big 4-engined French "Armagnac" air liner, described on this page.

**Bristol 170 "Freighter." The illustrations on this page are by courtesy of the Bristol Aeroplane Co. Ltd.**

### Good Service by "Freighters"

From all over the world come reports of continued fine service by Bristol "Freighters," which are now being operated in 15 different countries. One "Freighter" owned by Australian National Airways, for example, made 48 flights in a trial period of 14 days. During that time it was in the air for 117 hrs., carried nearly 400,000 lb. of freight and logged 18,000 miles of flying. As a result, A.N.A. ordered two more.

The Royal Australian Air Force, impressed by demonstrations during a "Freighter" tour of Australasia, ordered three to transport men and material to and from its Woomera rocket range, where landing facilities are of the most primitive kind, quite unsuitable for aircraft which require proper runways.

On the Berlin Air Lift a single "Freighter" carried 76,400 lb. in one day. Over a period of 10 days, it carried 292,700 lb. into and out of Berlin.

Typical of the awkward loads transported by "Freighter" was a 3¼ ton air compressor flown from Britain to Saudi Arabia, which was at work within four days of leaving England. In Ecuador, an eight-ton oil well vehicle of massive proportions was partly dismantled and flown in two trips to an oil well site in the heart of jungle territory, inaccessible to other forms of transport.

Silver City Airways is running a car ferry service across the English Channel with two "Freighters." In three months these aircraft carried nearly 400 cars and 1,500 passengers between Lympne and Le Touquet, taking only 20 minutes for the journey, which is operated 16 times a day in each direction.

Greatest tribute of all, however, is the fact that the "Freighter's" design has set a fashion for cargo-carrying aircraft that has been followed by designers all over the world.

### American Air Tours of Europe

American Overseas Airways has begun to operate special "See Europe in a Fortnight" trips designed to attract a completely new class of American tourists who aim, through transatlantic air travel, to spend their two-week holidays overseas.

One 14-day tour offers two days in London, one in Windsor, two in Paris, one in Versailles, two in Brussels, and a day each in Ghent and Bruges, the Hague and Amsterdam. Ten-day tours give passengers an intensive trip to Ireland and London, Scotland and London, or England and France. Americans interested in Scandinavia can choose tours throughout Norway, Sweden and Denmark.

### "Cherub" Aero Engine's Fine Record

A letter received by the Bristol Aeroplane Company from Mr. Vincent Boyes of Gippsland, Victoria, reveals that a Bristol "Cherub" aero engine which left the factory in July 1925 is still in active use in Australia after 24 years' continuous service.

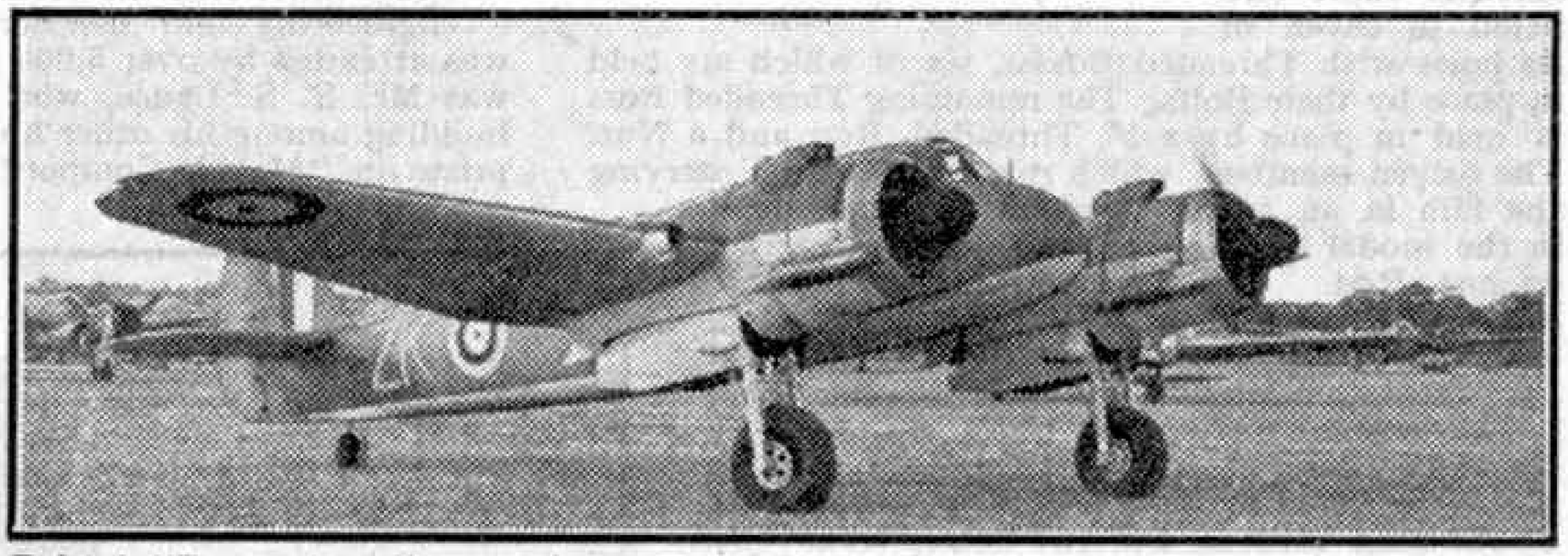
The "Cherub" is flying in the Beardmore "Wee Bee" monoplane which won chief prize at the Lympne Light Aeroplane Competitions in 1924, and is a two-cylinder horizontally-opposed engine developing 25 h.p. The last one was built by Bristols in 1926.

### The "Beau" Retires

One of the most famous R.A.F. wartime aircraft, the Bristol "Beaufighter," is being withdrawn from operational service after an active career of nearly nine years. The prototype "Beau" first flew in July 1939. The first production aircraft, equipped with Airborne Interception radar, came into service in September 1940, and five night-fighter squadrons were equipped with the type by the Spring of 1941. They inflicted steadily increasing casualties on German night bombers until *Luftwaffe* attacks died down.

Also in 1941 "Beaufighters" were allotted to North Sea patrol and escort duties, later machines being adapted to carry torpedoes and rockets which were used with devastating effect.

Others were sent to the Middle East, where their ground strafing activities in the Western Desert became one of the highlights of that campaign. In the Far East, Japanese soldiers called the "Beaufighter" "Whispering Death," the combination of a low approach and quiet engines often making its presence over the enemy felt and seen before it was heard.



**Bristol "Beaufighter," one of the R.A.F. types that became famous in the second World War and is now being retired from operational service.**

# Among the Model-Builders

By "Spanner"

**W. T. Taylor, Leigh, Stoke-on-Trent, who won First Prize in the No. 4 Outfit Model-Building Competition.**

## HOW TO USE MECCANO PARTS

*Threaded Pin (Part No. 115)*

The smooth portion of the Threaded Pin terminates in a squared shoulder and short threaded shank. The shoulder permits of the Pin being secured rigidly with the aid of a spanner. The part is intended primarily for use as a handle or as a fixed pivot for a ½" or 1" loose Pulley, but it has many other valuable uses. For example, in Fig. 1 it serves a useful purpose in the construction of a small Maltese Cross mechanism, a device that is very largely used in cinematograph machines for pulling the film through the projector in a series of intermittent movements, so that each tiny picture is made to pause for a moment behind the lens. If the film were pulled through in a continuous movement the screen would have the appearance of a confused series of pictures instead of the familiar clear and steady picture.

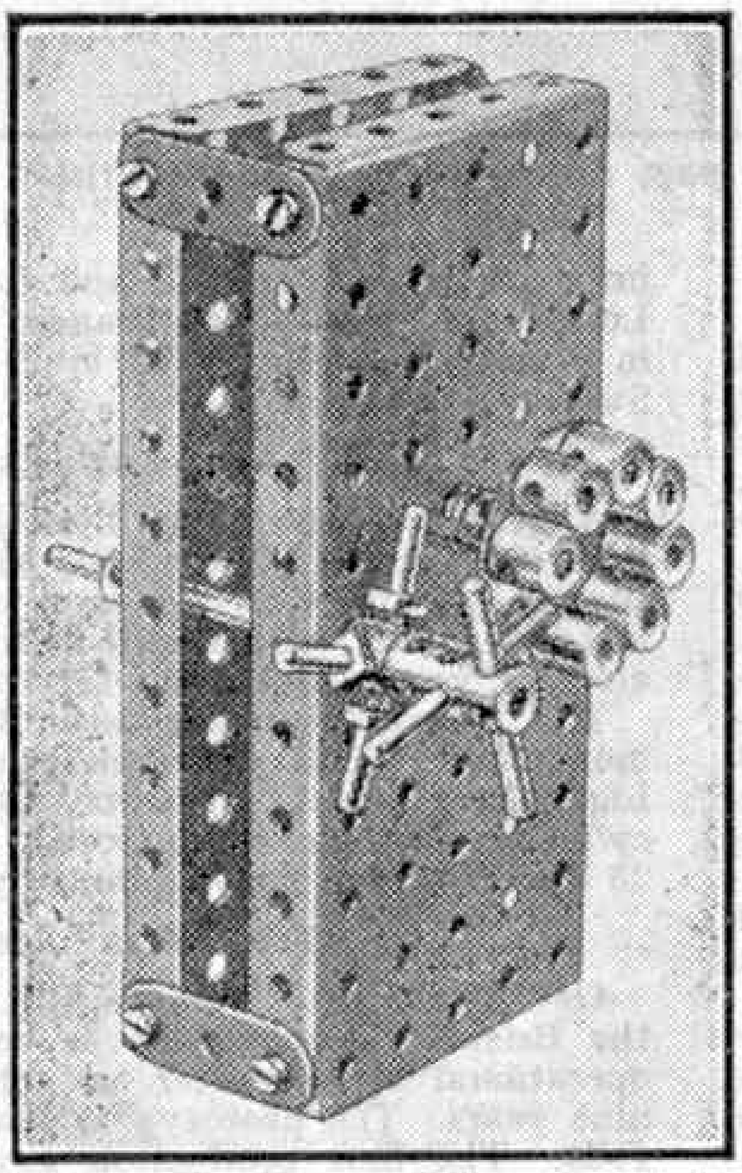


**Fig. 1. The Meccano Threaded Pin is used to good purpose in this interesting Maltese Cross Mechanism.**

The driving member consists of a Bush Wheel mounted on a suitable shaft and fitted in seven of its holes with Threaded Bosses, six of which are held in place by their Bolts. The remaining Threaded Boss is held in place by a 1" Threaded Rod and a Nut. The driven member, which rotates the drum carrying the film in an actual machine, is represented in the model by two built-up fittings carried on one Rod. The inner fitting consists of a "spider" taken from a Swivel Bearing, carrying four Threaded Pins. These Threaded Pins lock the "spider" securely to the Rod.

The second fitting is built up from a Coupling carrying two 1½" Rods. These parts are fitted at right-angles to each other by securing them in the two outer, transverse holes of the Coupling.

The operation of the movement is as follows. As the driving member rotates, the Threaded Rod strikes one of the Threaded Pins on the driven member, and at the same time the gap in the circle of Threaded Bosses allows one of the 1½" Rods to pass. Except when the Threaded Rod rotates it, the driven member is locked in position by the Rods in the Coupling as they bear lightly against the Threaded Bosses fitted on the Bush Wheel.

## A SIMPLE FREE WHEEL DEVICE

A free wheel device of some kind is often required in Meccano mechanisms and fortunately there are many ways in which such a device can be built up. When space permits, the idea shown in Fig. 2 might be found useful. In this arrangement a Sprocket Wheel is mounted freely on a Rod, and is fitted with two ⅜" Bolts, each of which carries a Spring Clip. The Clips are arranged on the Bolts so as to contact the teeth of a Ratchet Wheel fixed to the Rod against the face of the Sprocket. The Ratchet Wheel and Sprocket are held in place by a Collar. The lugs of the Clips must be adjusted so that they permit the Ratchet to revolve in one direction but prevent movement in the other by engaging the teeth. If a little oil is applied to the Ratchet the device will be found to work quite smoothly and reliably.

## THE GAINSBOROUGH SOCIETY OF MODEL ENGINEERS

At the Annual Exhibition organized by the Gainsborough Society of Model Engineers a prominent feature was the Meccano model section in which several fine exhibits were on view. One of the most interesting was an ingenious "Penny-in-the-Slot" machine for delivering boxes of matches, which was awarded First Prize. There was also a well-designed motor lorry, which has previously won a prize in an "*M.M.*" competition, and a giant crane. A photograph showing a few of the exhibits is reproduced on the following page. There were many other sections covering all branches of model engineering and handicrafts, and the exhibition was attended by over 5,000 people. One of the judges was Mr. E. S. Druce, who includes Meccano model-building among his other hobbies and has won several prizes in "*M.M.*" Competitions.

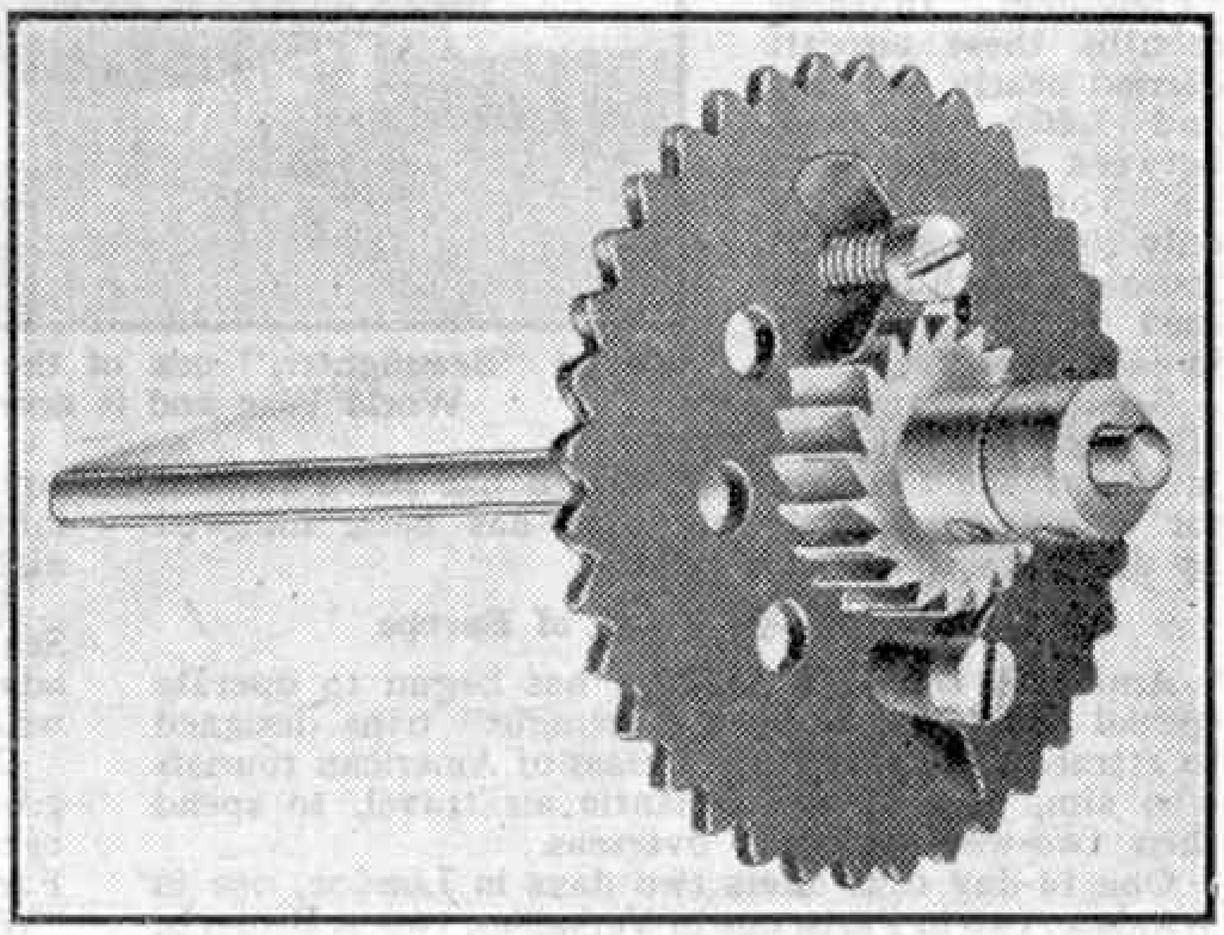
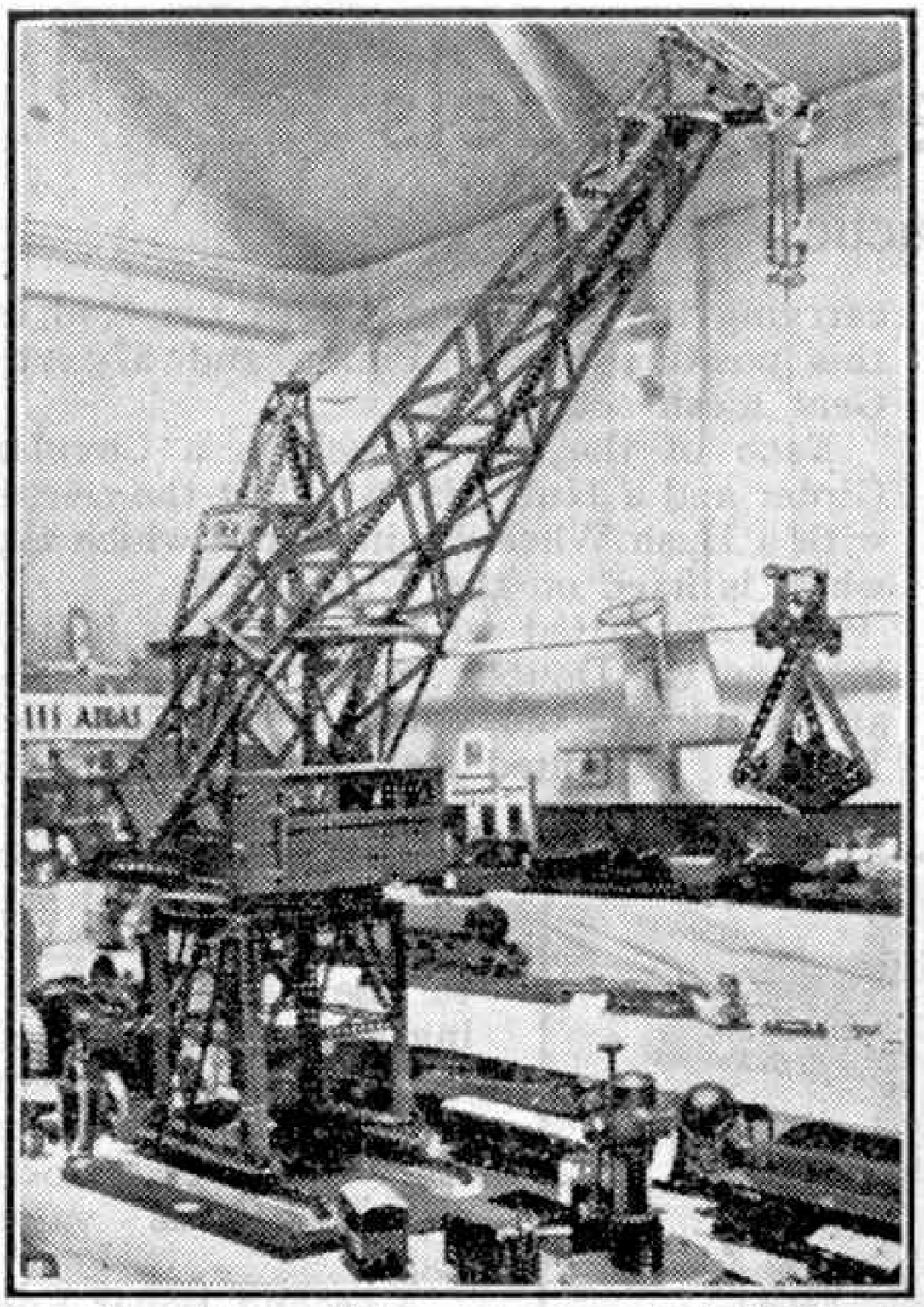


**Fig. 2. A simple free wheel device in which Spring Clips are put to novel use.**



**A section of the exhibits at the Annual Exhibition of the Gainsborough Society of Model Engineers. The fine Meccano crane was built by Mr. E. S. Druce.**

## HEAVY DUTY CLUTCH

The single plate clutch shown in Fig. 3 is capable of transmitting a drive of considerable power, and is specially suitable for use in large models of heavy lorries, buses, etc. The motor shaft 1 is fitted with a Face Plate 2, but the Rod projects only part of the way into the boss of the Face Plate. The output shaft occupies the free part of the boss.

The shaft 2 carries a 1½" Pulley 3, a Bush Wheel 4 and a second Bush Wheel bolted inside the Wheel Flange 5 by four 1⅛" Bolts 6. Compression Springs are placed on the 1⅛" Bolts between the Bush Wheel 4 and the Wheel Flange, and a Motor Tyre to fit a 1½" Pulley is carried inside the rim of the Wheel Flange. The 1½" Pulley and the Wheel Flange are free on Rod 2, but the Bush Wheel 4 is fixed so that the Compression Springs force the Wheel Flange against the Motor Tyre and the Face Plate.

The withdrawal mechanism is operated by a foot pedal 7 that is linked by a Strip to a Crank 8. Crank 8 is fixed on a transverse Rod mounted below the Rod 2, and carries two Couplings 9. A Centre Fork fixed in each Coupling engages the rim of Pulley 3, so that when the pedal is depressed the Pulley is withdrawn against the action of the Compression Springs.

It is important to make sure that the Compression Springs apply equal pressure to the Wheel Flange, and that the Centre Forks engage the rim of Pulley 3 simultaneously. The rim of the Pulley should be oiled to reduce friction when the clutch is disengaged, and light machine oil should be applied also to the 1⅛" Bolts. The oil should be used sparingly, however, as there is a tendency for it to be flung on the friction surfaces as the assembly rotates.

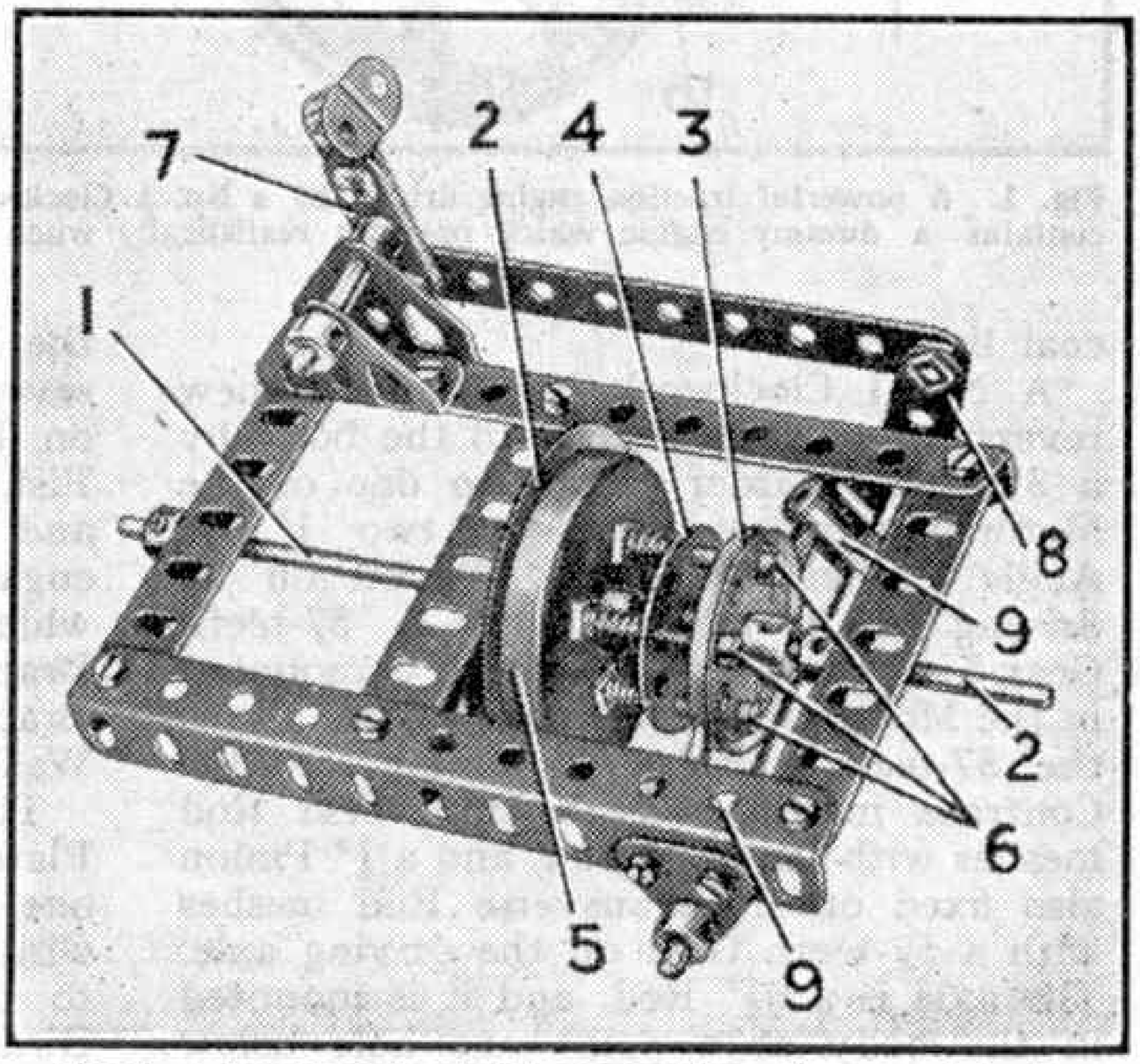



**Fig 3. A heavy duty clutch mechanism of unusual design.**

## MODEL-BUILDING COMPETITION RESULTS

We announce below the names of prize-winners in recent Meccano model-building competitions. Several of the successful competitors were taking part in a Meccano contest for the first time, and I am very pleased that they have managed to obtain prizes at their first attempt.

**No. 4 Outfit Contest (Home Section)**

First Prize, Cheque for £3/3/–: W. T. Taylor Stoke-on-Trent. Second Prize, Cheque for £2/2/–: D. R. Davies, Harrow. Third Prize, Cheque for £1/1/–: G. M. Taylor, Slough.

Six Prizes each of 10/6: G. P. Hughes, Prenton; I. Mills, Cheltenham; D. Atkinson, Boston; L. E. Adams, Oldbury; C. J. C. Harden, Cambridge; P. J. Skellern, Northolt.

Four Prizes each of 5/–: D. S. Lewis, Gwernogle; N. C. Gray, Bawtry; I. Macfarlane, Stafford; G. R. Parkes, Birmingham.

## "NEW YEAR" COMPETITION

**Home Section**

First Prize, Cheque for £3/3/–: K. L. Walker, W. Worthing. Second Prize, Cheque for £2/2/–: F. Coltman, Loughborough. Third Prize, Cheque for £1/1/–: W. A. Picken, Gainsborough.

Five Prizes each of 10/6: M. G. Slater, Newcastle-on-Tyne 3; I. A. Heywood, Macclesfield; W. Norfolk, Feering; M. E. Cane, Fleet; G. Hyde, Llanelly.

Five Prizes each of 5/–: I. Macfarlane, Stafford; G. Hayward, Wickham Market; C. E. Wrayford, Bovey Tracey; T. Lyford, Didcot; G. Wyeth, Alton.

**Overseas Section**

First Prize, Cheque for £3/3/–: A. W. Dickie, Dunedin. Second Prize, Cheque for £2/2/–: G. Burns, Warragul, Australia. Third Prize, Cheque for £1/1/–: B. Williamson, Karori, Wellington.

Five Prizes each of 10/6: L. Phillips, Westport, New Zealand; J. Lowndes-Yates, Calgary, Canada; S. Wall, Gibraltar; J. B. Thompson, Nimbin, Australia; M. M. Maffei, S. Paul, Brazil.

Five Prizes each of 5/–: S. Reid, Quebec; K. Tighe-Umber, Dunedin; G. Ellis, Johannesburg, S.A.; G. T. Jones, Kingston, B.W.I.; J. Sutcliffe, Nairobi, Kenya.

# New Meccano Models

## Clockwork Traction Engine

OUR new model this month is a powerful traction engine operated by a Clockwork Motor. It is simply designed and easy to build.

Each side of the body consists of a $5\frac{1}{2}'' \times 3\frac{1}{2}''$ Flat Plate, bolted at the rear to a $3\frac{1}{2}'' \times 2\frac{1}{2}''$ Flanged Plate 1 and at the front to $3\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strips 2 and 3. The sides are extended by $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Flexible Plates joined by three $3\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strips which represent the coal bunker.

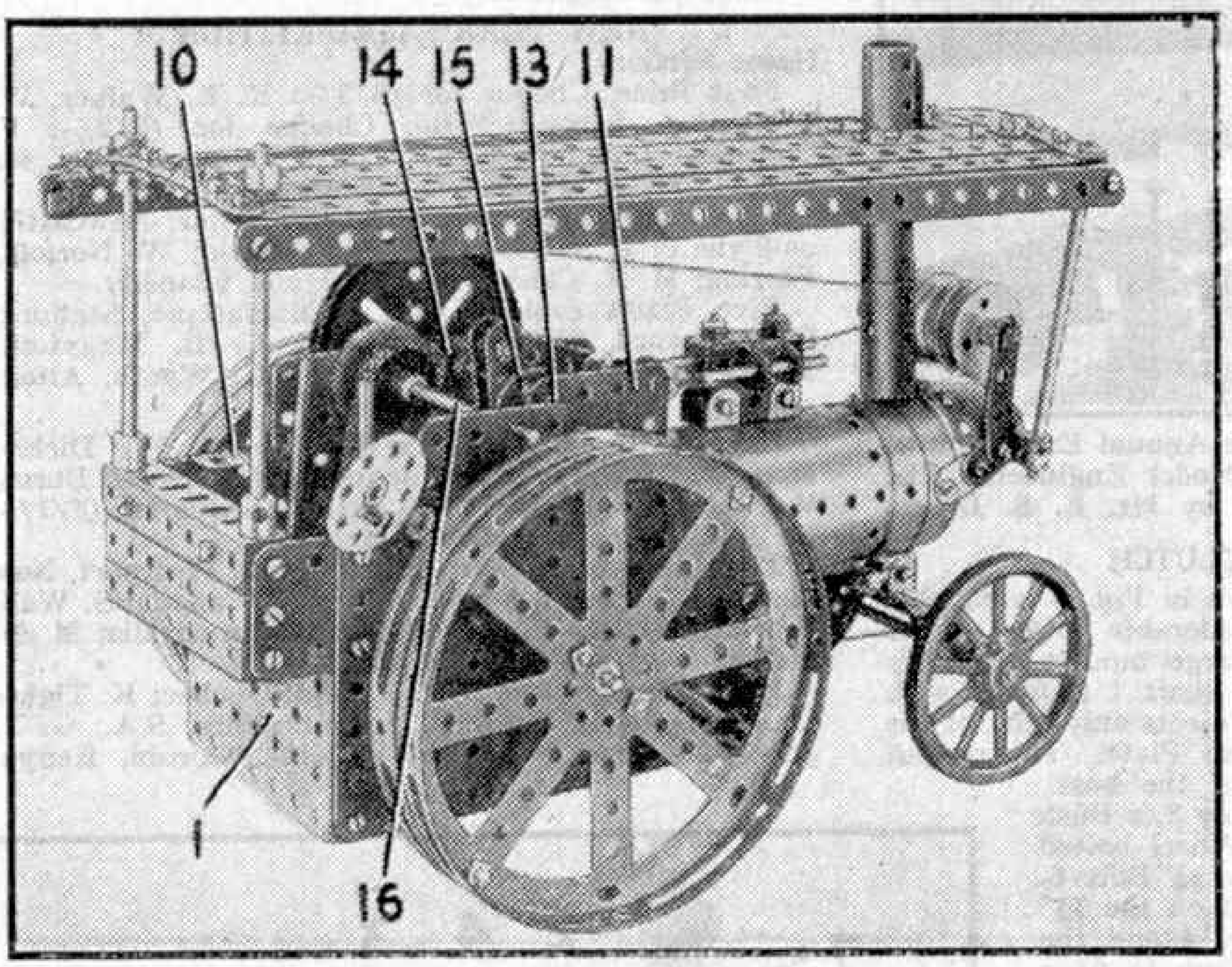



**Fig. 1. A powerful traction engine driven by a No. 1 Clockwork Motor. It contains a dummy engine which operates realistically when the tractor is in motion.**

A No. 1 Clockwork Motor of the new reversing type is attached to the body by a 3″ Angle Girder bolted to one of the Motor side-plates, and by two $1'' \times \frac{1}{2}''$ Angle Brackets 4. A $\frac{1}{2}''$ Pinion on its driving shaft meshes with a 57-teeth Gear 5 on a $2\frac{1}{2}''$ Rod 6. Rod 6 is mounted in the Motor side-plates, and carries above the 57-teeth Gear a $\frac{1}{2}''$ Pinion. A $1\frac{1}{2}''$ Contrate mounted on a transverse Rod meshes with the $\frac{1}{2}''$ Pinion, and a $\frac{3}{4}''$ Pinion also fixed on the transverse Rod meshes with a 57-teeth Gear on the driving axle. The axle is a $6\frac{1}{2}''$ Rod, and it is mounted in the body at a point one hole below and three holes in front of the Rod carrying the $\frac{3}{4}''$ Pinion. With the Rod in this position the $\frac{3}{4}''$ Pinion and 57-teeth Gear mesh accurately.

Each of the rear wheels is a Circular Girder and a Hub Disc fitted at the centre with a Bush Wheel by means of which the wheel is fixed on the driving axle.

A Boiler fitted with one End is bolted between the Double Angle Strips 2 and 3, and a cylinder block formed by a Channel Bearing is bolted to Double Brackets fixed to the boiler. Bearings for the piston rod are provided by Angle Brackets fixed to the Channel Bearing, and a Rod carried in a Double Bracket bolted to the side of the cylinder block represents the valve rod.

A second Boiler End is attached to the front of the Boiler by $\frac{3}{4}''$ Bolts, and is fitted at the top with a Chimney Adapter and at the bottom with a Double Bracket 7. A further Double Bracket bolted to the Bracket 7 provides support for the front axle, which consists of a 5″ Rod held by Collars in a $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strip. A short length of Cord is tied at each end to the Double Angle Strip, and then passed several times round three Couplings fixed on Rod 8. This Rod is passed through Fishplates bolted to the front of the body, and on it is a $\frac{1}{2}''$ Pinion 9. The Pinion engages a Worm on the steering column, which is a $6\frac{1}{2}''$ Rod mounted in Angle Brackets fixed to the body. The Angle Brackets are spaced from the body by two Washers on each bolt holding them.

The upper edges of the $5\frac{1}{2}'' \times 3\frac{1}{2}''$ Flat Plates are fitted with $5\frac{1}{2}''$ Angle Girders, one of which is seen at 10. A $3\frac{1}{2}''$ Flat Girder is bolted across these Girders and to the Double Angle Strip 3, and the Girders are also joined by a $3\frac{1}{2}''$ Strip placed at a point three holes behind the

Flat Girder. The Girder Brackets 11 provide bearings for the crankshaft and are bolted to the 3½″ Strip and the 3½″ Flat Girder.

The crankshaft is a 2″ Rod 12 and a 1″ Rod 13, each of which is fitted at its inner end with a Double Arm Crank. Rod 12 carries a ¾″ Pinion 14 and Rod 13 an Eccentric 15. The connecting Rod is a 2″ Strip pivoted on a ½″ Bolt passed through the slotted holes of the Double Arm Cranks. The Bolt is fixed to each of the Cranks by nuts. The connecting rod is linked to the piston rod by a Rod and Strip Connector, and the Eccentric 15 is connected to the valve rod by a second Rod and Strip Connector.

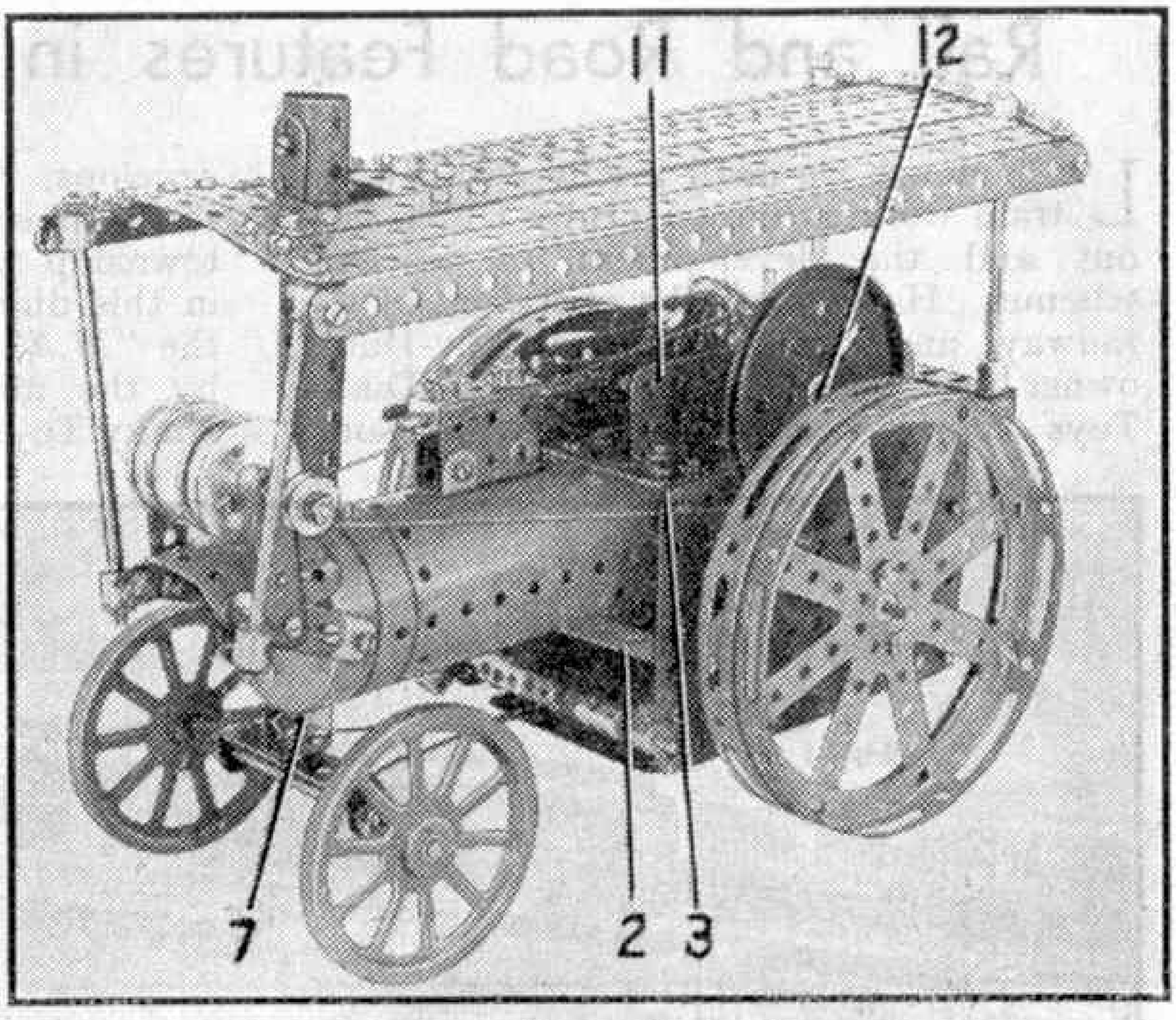



**Fig. 2. Another view of the traction engine.**

The ¾″ Pinion 14 meshes with a 50-teeth Gear on Rod 16. This Rod is mounted in Girder Brackets bolted to the 5½″ Angle Girders 11, and is fitted with a 1″ Sprocket. The Sprocket is connected to a similar Sprocket on the Rod carrying the 1½″ Contrate.

A 2½″ × 1½″ Flexible Plate forms a platform for the dynamo and is attached to the boiler front by a Fishplate at the top and by a 1½″ Strip extended by a Fishplate at each side. The dynamo is made up of four 1⅛″ Flanged Wheels fixed on a 3″ Screwed Rod. A ½″ Pulley at the end of the Screwed Rod is connected by Cord to the flywheel on the crankshaft. The dynamo is held between 2″ Strips bolted to the platform.

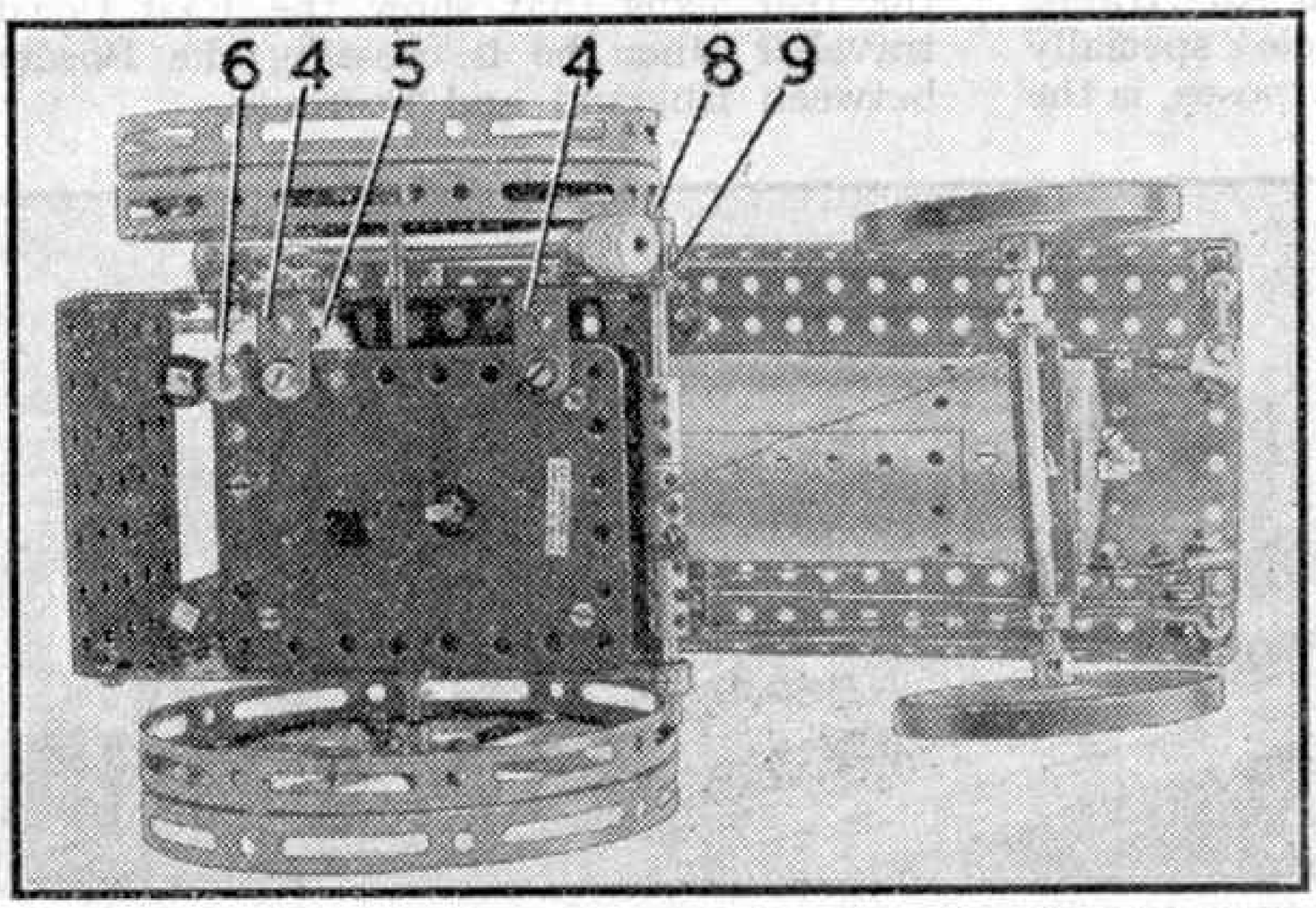



**Fig. 3. An underneath view of the tractor showing how the Motor is fitted.**

## OCTOBER GENERAL MODEL-BUILDING COMPETITION

This month usually brings the start of the main model-building season of the year, and with this in mind we are announcing a new General Model-Building Contest. These competitions have always been very popular, and in view of the approaching long dark evenings we are looking forward to receiving a record number of entries.

The competition is open for models of all types built from Meccano parts, and there is no restriction on the size of Outfit or number of parts that may be used. The main points the judges will look for in entries are originality in the choice of subject, neatness in design, and novelty in the use of parts.

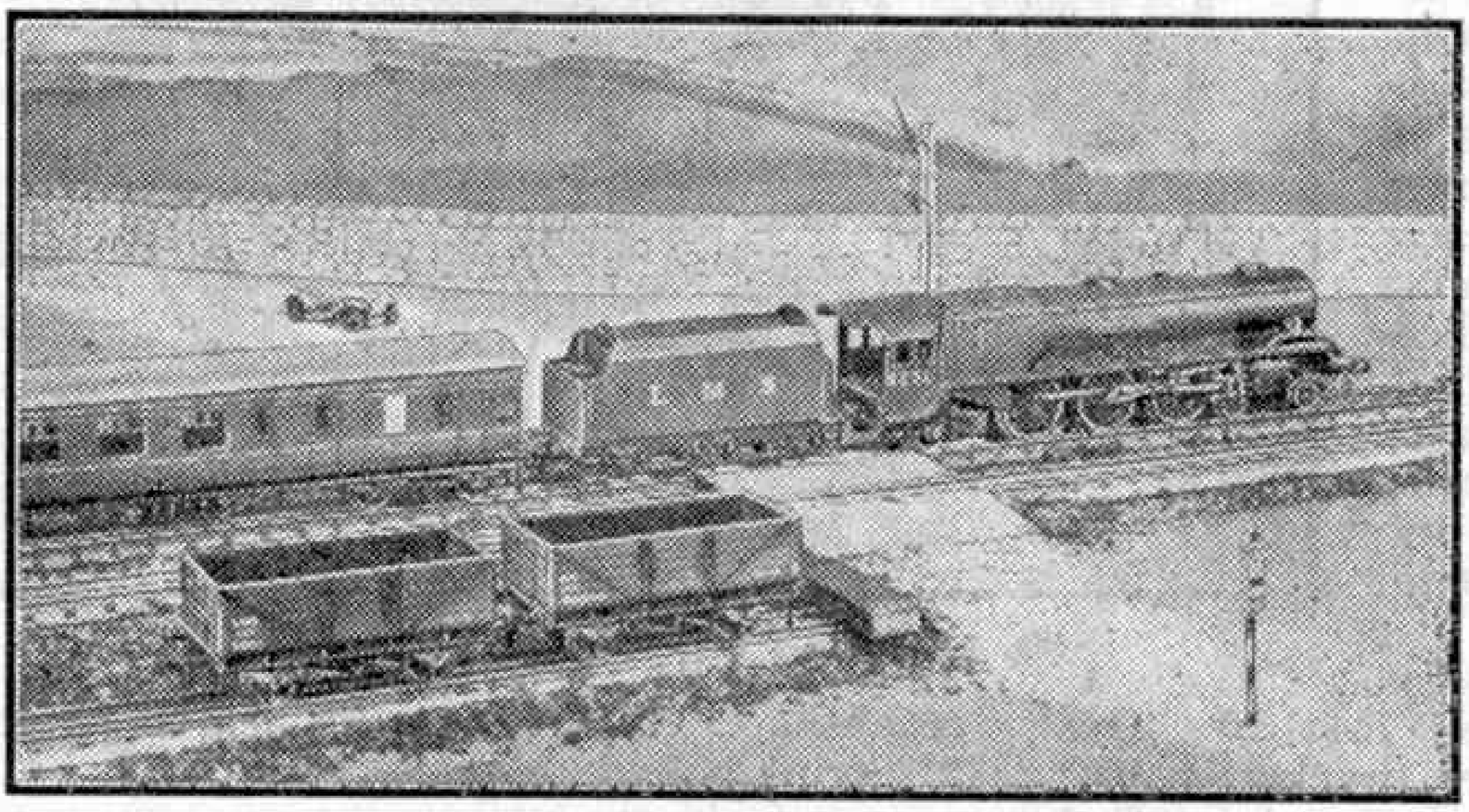
*Actual models must not be sent.* All that is required is a clear photograph or sketch, together with a few brief notes covering the main points in design and any interesting constructional features.

The contest will be divided into two sections, for Home and Overseas readers respectively. The closing date in the Home section will be 30th November, 1949; entries in the Overseas section will be accepted until 31st January, 1950. Entries must be addressed "*October General Model-Building Contest, Meccano Ltd., Binns Road, Liverpool 13,*" and the competitor's age, name and address must be written clearly on the back of each photograph or sketch submitted.

The following prizes will be awarded in each Section of the Contest. First, Cheque for £3/3/–; Second, Cheque for £2/2/–; Third, Cheque for £1/1/–. There will be also five prizes each of 10/6 and five of 5/–.

# Rail and Road Features in Hornby-Dublo

LAST month we dealt briefly with simple train working on a Hornby-Dublo lay-out and the development of working schemes. Having got the operation of the railway under way, the Hornby-Dublo owner usually makes good use of Dinky Toys motor vehicles to provide some additional life and movement about the layout.



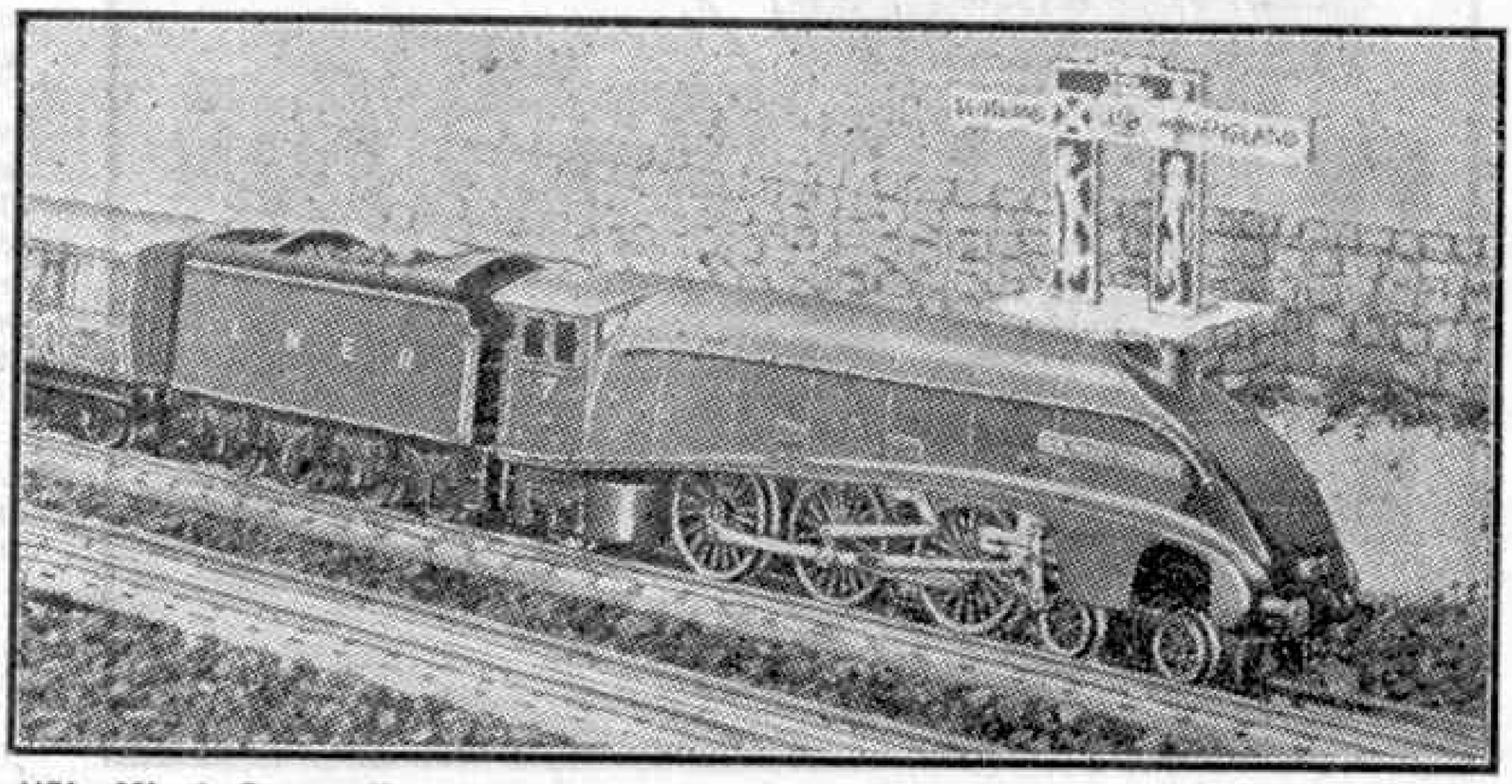
**The Hornby-Dublo "Duchess of Atholl" and its train passing a wayside siding. The scenic background and wall are very effective.**

The Dinky Toys Double Deck Bus mentioned last month can be supplemented by the Single Deck Bus for certain services. They can be supposed to be operated by the railway authorities, or they can represent stock of an independent operator. Whichever arrangement is favoured, the running of the buses can be made to connect with the operation of trains. Another Dinky Toys vehicle specially suitable for Hornby-Dublo purposes, is the Forward Control Lorry. Some Hornby-Dublo owners make a prominent feature of their road services and the younger members of the staff are usually only too willing to do the necessary "driving".

So it becomes necessary to separate the railway from the road, usually by means of simple fencing or walls made up in wood or card. As the general scheme develops, buildings almost always make their appearance, until quite a miniature township is the result. The possibilities in this direction have been well shown in the "*M.M.*" on several occasions recently by the miniature towns constructed by Dinky Toys enthusiasts.

Lineside, or road-side, structures are usually made of card. Sometimes it is possible to use a box or carton for the main part of the building, various additions being built on as required. Plain boundary walls, which are needed to some extent on most layouts, can be simple strips of wood or card; some boys may prefer fencing, but walls are easier to make. As with buildings, the finishing can be done by painting, and then different styles of construction can be readily shown. The lineside walls in the illustration on this page were made in this way; the actual "stones" are represented by ink lines.

The lineside sign in the lower illustration is an unusual feature typical of the numerous items that a keen Hornby-Dublo owner can make for himself. It is made in fairly thick card and its design is based on that of the real signs that show the East Coast traveller when he is crossing the Border between England and Scotland.



**"Sir Nigel Gresley" crossing the "Border" on a Hornby-Dublo layout. The lineside sign and the boundary walls are good examples of home-made accessories.**

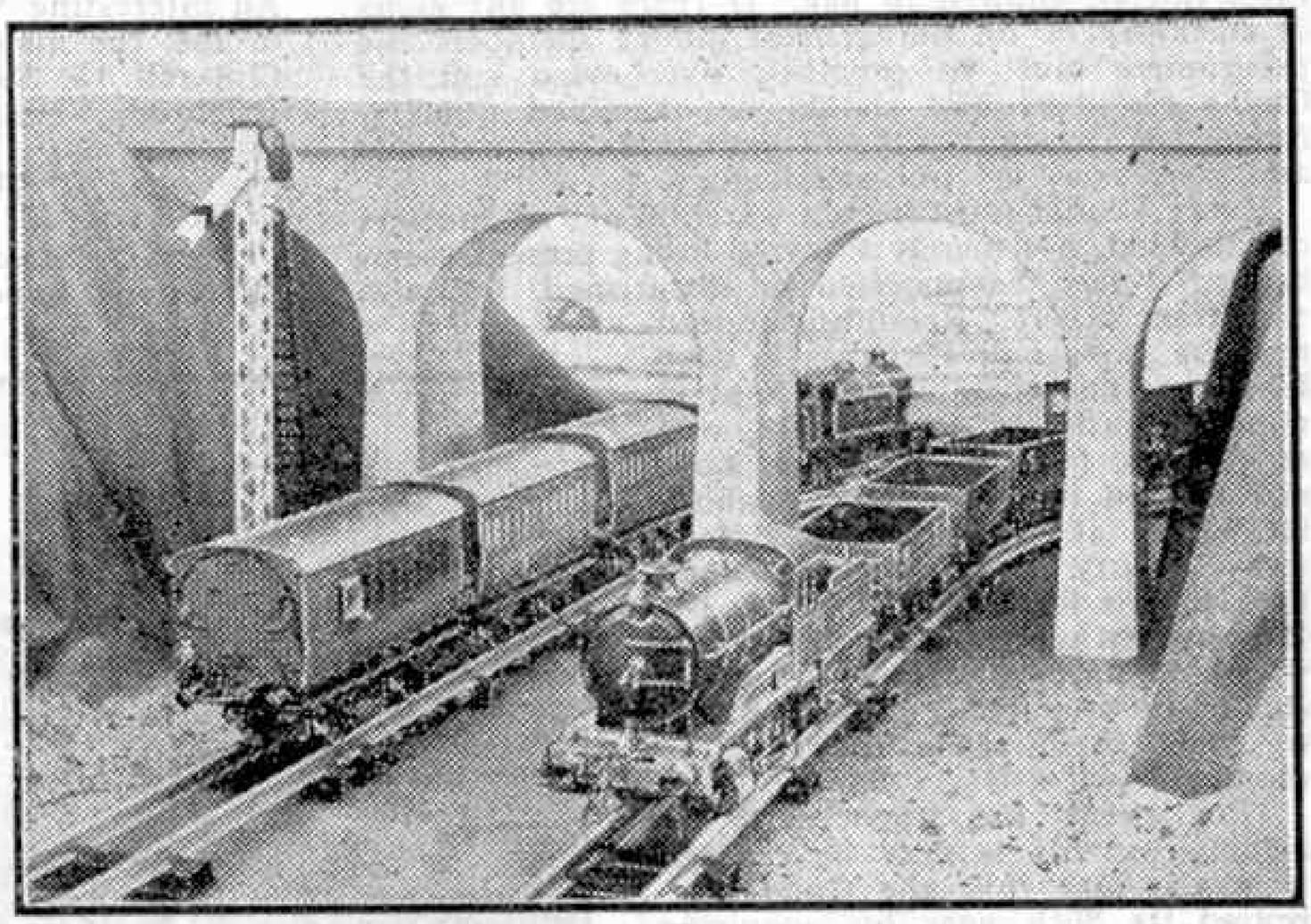
# Head and Tail Lamps for Hornby Trains

LAMPS of various kinds are used for many different purposes in railway working, but probably those that we notice most, as lamps, are carried at the front end of engines or at the tail of their trains. These are always fascinating, and in last month's "*M.M.*" the article "*What Do the Headcodes Mean*" dealt with the different arrangements of lamps and route indicating discs, the latter being a special feature of Southern Region operations.

Naturally the keen Hornby railway owner attaches considerable importance to the correct indicating of his trains. All Hornby Locomotives from the No. 101 upward are provided with lamp brackets or "irons" and a set of lamps. As the lamps are separate fittings, and detachable, their positions can be varied just as they are in real practice to indicate different classes of trains. The H.R.C. booklet, as all members will know, contains a diagram of the head lamp code. We soon become familiar with the head lamp positions that we see and use regularly, but it is handy to have the booklet to look at when we are making up a kind of train that we run only occasionally.

The upper illustration on this page shows a through freight train taking its load intact to destination; so the two lamps used are respectively one in front of the chimney and the other in the centre above the buffer beam. The stopping train going the opposite way would have a single lamp in front of the chimney. This indication, and that on the engine of express trains—a lamp over each buffer—are probably the best known.

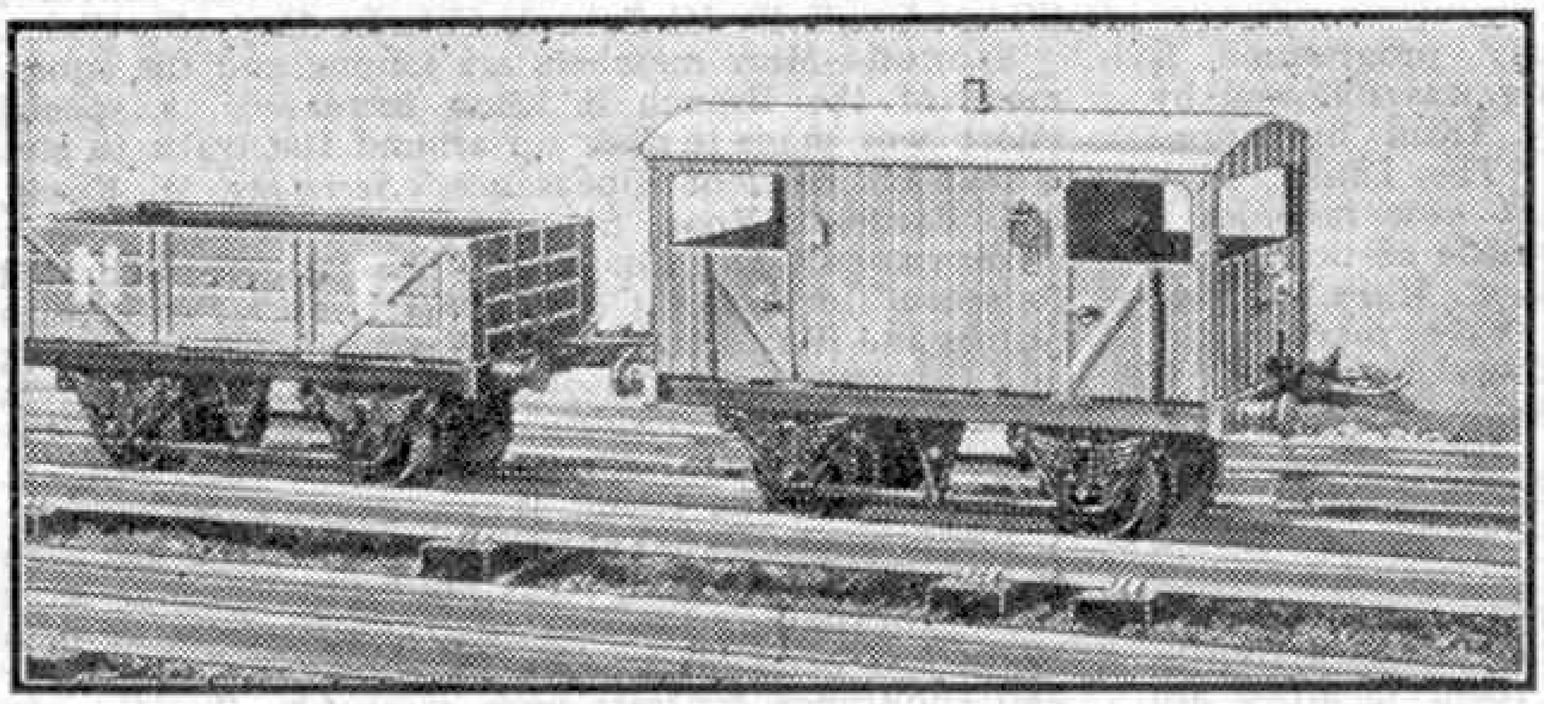
Trains have to carry a tail lamp to show that they are complete and the presence of the lamp must be checked by the signalmen as the trains pass them. So the Hornby No. 101 and 501 passenger train sets have their No. 1 rolling stock fitted with lamp brackets, and tail lamps are provided. Coaches as well as the Passenger Brake Van have brackets, because at times an ordinary coach may have to be the last vehicle of a train.



**A through goods train and a stopping passenger train on a Hornby layout pass one another in a realistic cutting.**

The fitting of lamp brackets is being extended to Goods Brake Vans of the Hornby range. Real goods brakes display quite an array of lamps, as side lamps are carried in addition to the tail lamp. The side lamps at night each show a white light ahead so that the driver can tell on looking back that his train is complete. The usual red light is shown to the rear. The lower illustration shows a Hornby Goods Brake with side and tail lamps.

At present, spare lamps are not available, so that Hornby train owners must be careful not to lose any.



**A Hornby Goods Brake Van showing side and tail lamps in position.**

# Club and Branch News

## WITH THE SECRETARY

### THE GUILD'S THIRTIETH BIRTHDAY

All is now well set for the indoor season in Clubs and Branches. The first meetings of the Autumn Session have actually been held in most cases, and the greatest enthusiasm prevails everywhere. This must not be allowed to flag. If there are any signs of slackness or discouragement among members the programme must be promptly overhauled and the Club's resources also should be examined quickly, for good work is impossible if meetings are not enjoyable and conditions are not satisfactory.

Every Leader must keep a watchful eye on matters of this kind, not merely to avoid losing present members who feel disappointed or dissatisfied, but also to attract others. Recruiting indeed remains an ever present task in Club life. It is one that must be kept in mind by ordinary members as well as officials, for unless younger boys are brought into a Club throughout its career it will eventually fade away. Plenty of new members should be available for all Clubs among the Meccano enthusiasts in their districts who have not yet joined, and plans should be made to reach these and to bring them along to the Club room.

How great the opportunity of gaining recruits is may be realized from the fact that the Guild celebrated its 30th year by acquiring 13,000 new members. Its formation was announced in the September-October 1919 issue of the "*M.M.*" and in its lifetime it has enrolled altogether more than 150,000 members.

The Hornby Railway Company is younger, but is equally vigorous. During the past 12 months this organization has gained nearly 20,000 members, and the flow of recruits continues. This should mean greater prosperity among Branches, and splendid opportunities for forming new ones, while Meccano Clubs should find it easier to add to the attractions of their programmes by forming Hornby Train Sections.

## CLUB NOTES

THATCHAM M.C.—A very busy programme is followed. The successful Exhibition was followed by intensive Model-building, Hornby Train operations and Stamp Collecting meetings. The Dinky Toys layout also has been extended; it now includes a miniature wood, a town, a countryside section and a coast line with a miniature "*Queen Mary*." Cycle runs, Rambles and Paperchases have marked the summer season. Club roll: 30. *Secretary:* B. M. J. Ambrose, 51, Southend, Cold Ash, Nr. Newbury, Berks.

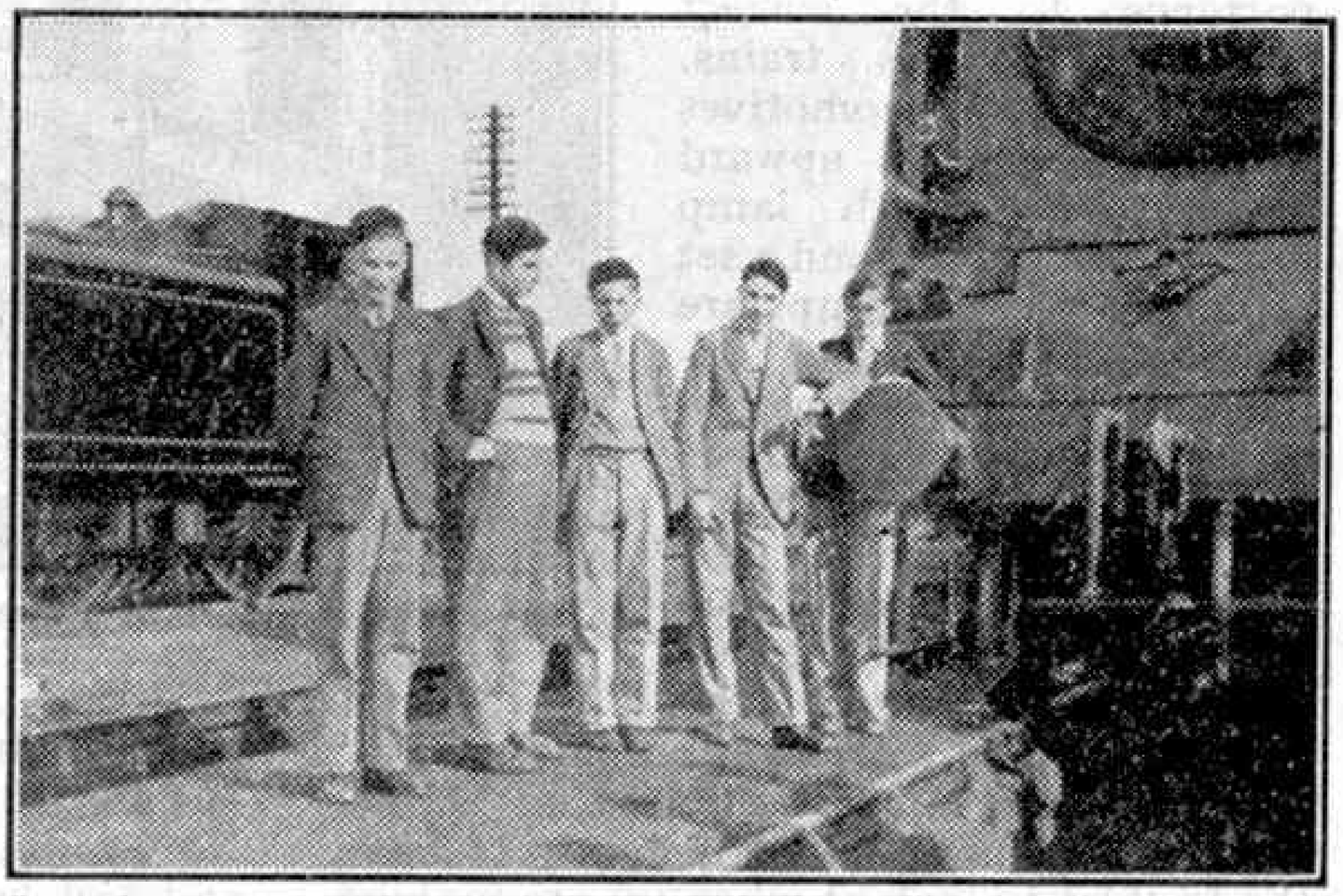
WHITCHURCH (GLAM.) M.C.—Group models have been constructed, notable productions including a hammerhead crane, a mechanical excavator, a tractor and a combination lock. Photograph and Aquarium Sections are being started, and model railway activities are in prospect. Increased club room facilities are making excellent work possible. An extensive telephone system has been installed. Club roll: 8. *Secretary:* F. G. Butler, 6, Mervyn Road, Whitchurch, Glam.

### AUSTRALIA

BRIGHTON (VICTORIA) M.C.—This newly affiliated Club has made a fine start, with excellent model-building and model aeroplane construction and flying. A Hornby Dublo railway is being installed. An interesting Visit was paid to the Essendon Aerodrome, the main air transport centre for Melbourne. Club roll: 15. *Secretary:* J. Stamp, 11, Menzies Avenue, Brighton, Victoria.

## BRANCH NEWS

RYDAL SCHOOL (COLWYN BAY)—Minor track alterations have included the re-laying of points.



**Committee members of the Borden Grammar School M.C., Leader, Mr. J. H. Weekes, Secretary, S. Wood, visiting the Ashford Works of the Southern Region, British Railways. This fine school Club was affiliated in May 1929, and under the guidance of Mr. Weekes has entered upon a new period of intense activity. The programme includes Model-building, Talks, Film displays, and Visits, and a very successful Exhibition in conjunction with the School Arts Festival.**

A general overhaul is in progress, and plans are being made for extensive alterations, including the building of a high level terminus. The Annual Exhibition was held at half term. *Secretary:* R. H. Wolstenholme, "Crusaders," Rydal School, Colwyn Bay, N. Wales.

SLOUGH—More members are joining and the equipment of the Branch is being increased. A special effort was made to clear up around the track to give a neat and efficient appearance. *Secretary:* W. Eisele, 335, Farnham Road, Slough, Bucks.

WEYMOUTH AND DISTRICT—The Branch celebrated its second birthday at Headquarters by a Party, with Games and Refreshments. Members enjoyed Swimming and Cricket during the outdoor season. Locomotives were inspected at close quarters during a visit to the Salisbury Motive Power Depot. *Secretary:* A. J. Brown, 68, Wyke Road, Weymouth, Dorset.

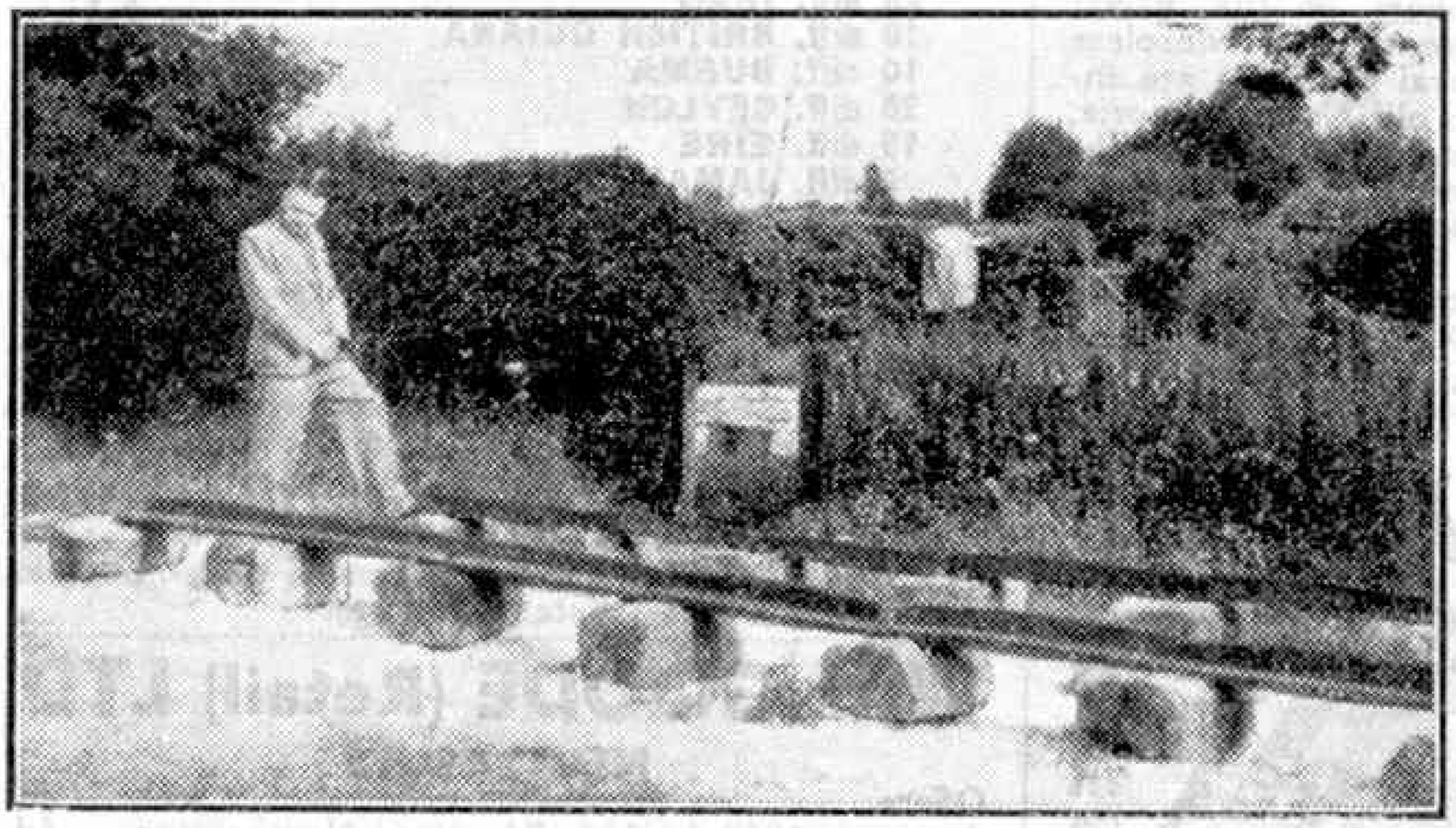
BEDDINGTON CRUSADERS—The Club track has been re-laid and more rolling stock has been acquired. More successful running has followed these changes. A Gala Night has been held, when locomotive speed, power and endurance contests were arranged. *Secretary:* B. Sheppard, 11, Cherry Hill Gardens, Waddon, Croydon.

# From Our Readers

*This page is reserved for articles from our readers. Contributions not exceeding 500 words in length are invited on any subject of which the writer has special knowledge or experience. These should be written neatly on one side of the paper only, and should be accompanied if possible by original photographs for use as illustrations. Articles published will be paid for. Statements in articles submitted are accepted as being sent in good faith, but the Editor takes no responsibility for their accuracy.*

## THE WORLD'S FIRST PUBLIC RAILWAY

The first railway ever to receive an Act of Parliament was the Surrey Iron Railway, opened in 1803, which ran from Wandsworth to Croydon. A Bill authorizing the construction of an extension to Reigate, with a branch to Godstone, was then promoted. The title of the extension was "The Croydon, Merstham and Godstone Iron Railway Company," although its main line was to run from Croydon to Reigate. The line was opened as far as Merstham in 1805.



**Old Croydon, Merstham and Godstone Railway permanent way at Merstham. Photograph by D. J. W. Brough, Cheam.**

To-day little can be seen of the old Surrey Iron Railway, as the district through which it ran has been largely built over; but traces of the continuation line still remain. Recently I spent an enjoyable afternoon walking over the course of the old Croydon, Merstham and Godstone Railway between Coulsdon and Merstham. This district is still comparatively open, and the route can be followed without much difficulty. The major engineering work was a cutting, over a mile in length, that runs parallel to the main Brighton road, and most of it is still more or less intact. Three brick bridges, which carried roads over the railway, also survive, but two of them are now almost buried by earth.

Some of the original permanent way is still in existence, and a short length has been preserved in the recreation ground at Purley. Another short length can be seen at Merstham, and this is shown in the accompanying photograph. It will be noticed that the rails are flanged. This was necessary, as the wheels of the wagons had no flanges.

The rails are of cast iron, and are about 3 ft. long. They bear the initials of the railway. The sleeper blocks are of stone, and each has a hole drilled through it into which a wooden peg was inserted. The rails were held in place by iron spikes driven into the pegs. Many of the stone sleeper blocks can still be seen in the vicinity. Some have been used for building walls, and others have been incorporated in rockeries in private gardens. The gauge of the railway has never been definitely established, but the available evidence suggests that it was about 5 ft.

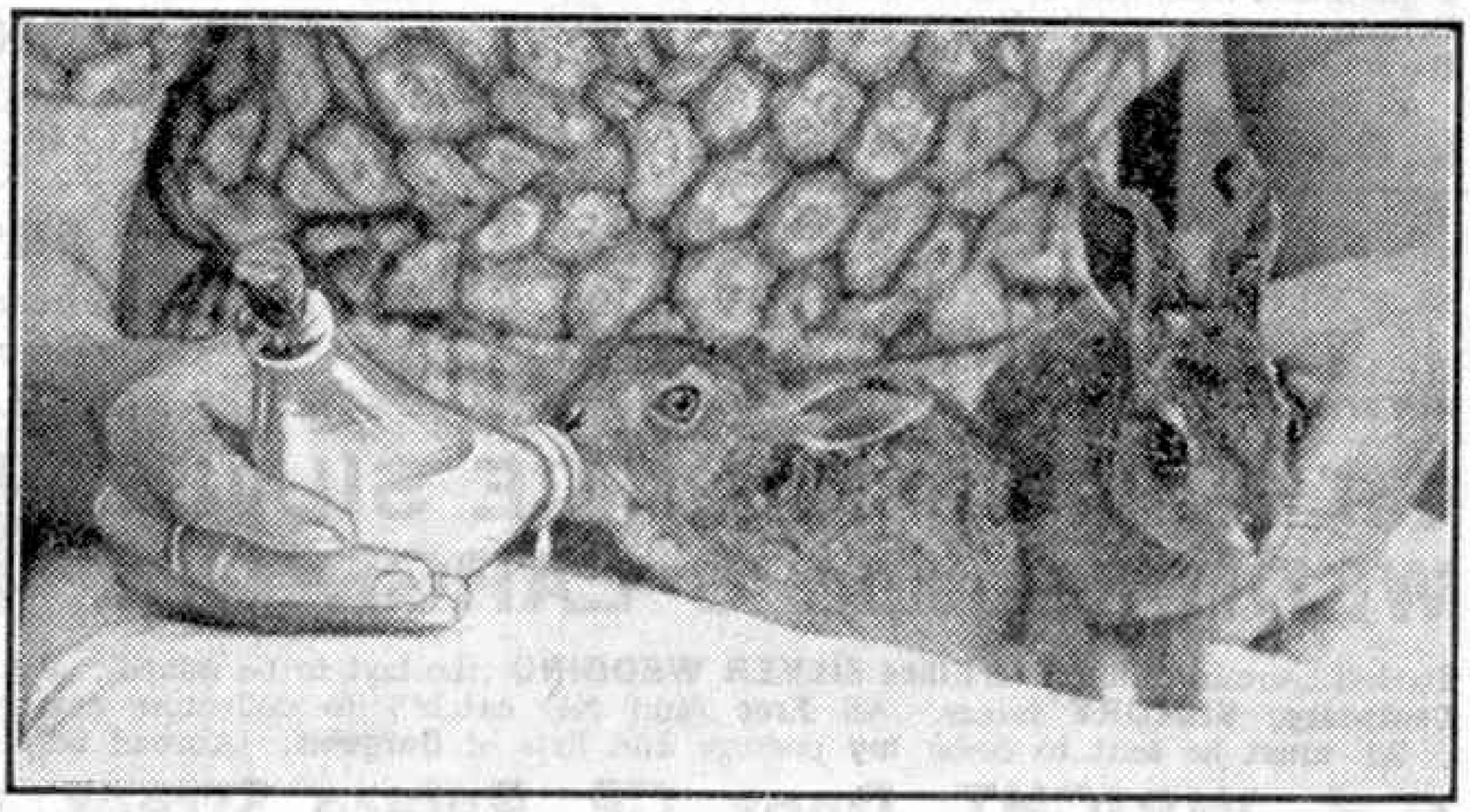
D. J. W. Brough (Cheam).

## HARE-RAISING EXPERIENCE

The leverets shown in the lower photograph on this page are the survivors of a litter of four, discovered the day they were born when grass was being cut with a rip-hook. They had been deserted by their mother, so they were taken to Mrs. C. Hoskins of Chandlersford, who keeps rabbits, to be cared for. After seven days the two weaker ones died, but the other two throve on three ounces of milk a day fed through the valve of a small baby's bottle, and eventually began to nibble greenstuff.

The baby hares were the main topic of conversation in the School Lane area in Chandlersford, near Southampton, where Mrs. Hoskins lives. It is apparently very rare for wild hares to live in captivity, and in fact some people say it is impossible. Anyway these little fellows grew from about 2½ in. to about 6½ in. long in thirty days, and from the way they fought over that milk bottle it was easy to see they meant to go on living!

G. S. Finlayson (Shirley, Southampton).



**Leverets reared on the bottle. Photograph by G. S. Finlayson, Shirley, Southampton.**

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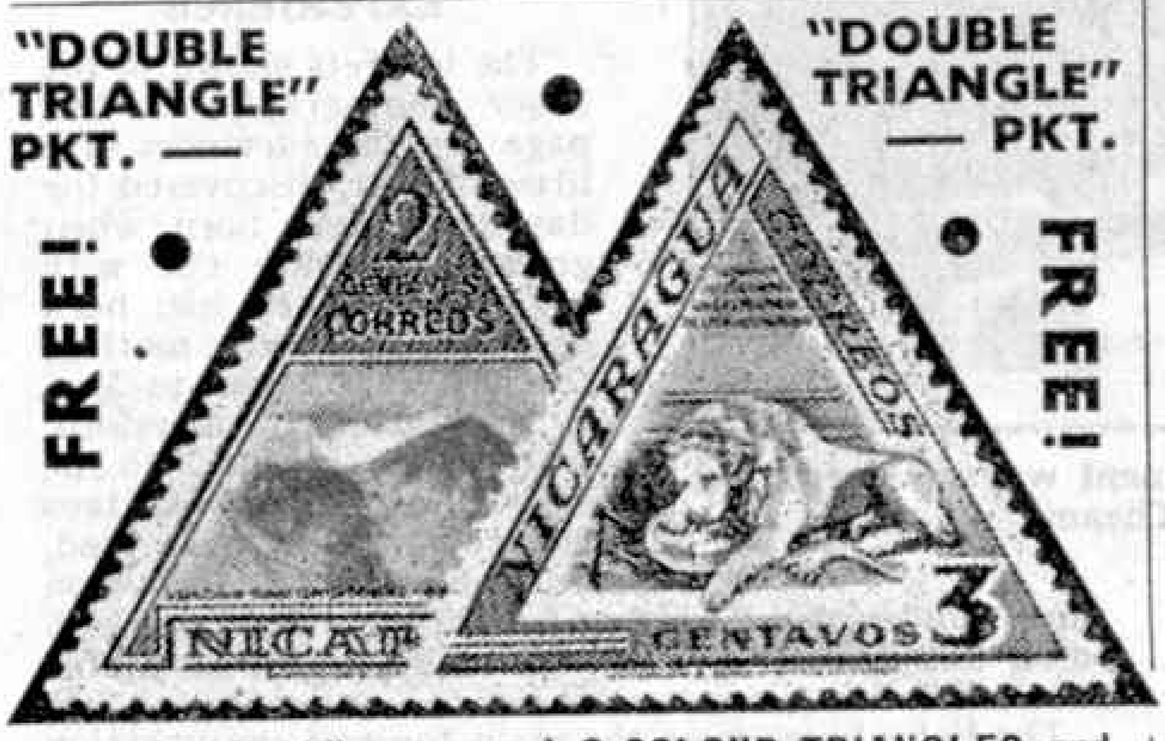


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*For other Stamp Advertisements see also pages 402 and xi.*

# Stamp Collecting

## The Universal Postal Union

By F. Riley, B.Sc.

NOWADAYS we can write letters to most corners of the globe, put on stamps of reasonably small value, and send them away with confidence that they will be taken to their destination easily and quickly. Posts were not always as convenient and reliable as that, however. For instance, little more than 75 years ago there were six different rates for letters from London to Constantinople, varying from 8d. to 1/7d. per ½ oz. The postal charges for such letters were sometimes paid by the sender, sometimes by the receiver, and in some cases were shared; and delays were frequent, for the letters themselves had to be weighed and complicated calaculations made in order to find the costs.

The first suggestion to bring this chaos to an end came from Dr. von Stephan, the head of the German Post Office 80 or so years ago, who had the idea of calling a universal congress to improve matters. The Franco-German War prevented immediate progress, and it was not until 1874 that a congress actually met, at Berne in Switzerland, and the Universal Postal Union was founded. Since then a congress to discuss international postal affairs has been held every five or six years. The number of countries represented at Berne 75 years ago was 22, all European except the United States and Egypt. Other countries joined later, and by 1928 those included in the Union were responsible between them for 40,000 million letters a year, a number that since then must have increased considerably.

It is only natural that the U.P.U. should have been recognized by the issue of stamps to mark its beginning and progress, and it is not surprising to find that it is now the custom for a country in which a congress is being held to issue special stamps in honour of the occasion. Even Great Britain has done this, although commemorative stamps are exceedingly rare here. The congress celebrated in this way was the 9th, of 1929, in connection with which five stamps appeared. Four of these are low values, from ½d. to 2½d., and are not particularly attractive in design, as the example shown on this page indicates. The fifth is a £1 stamp, a much larger one, on which is a splendid picture of St. George and the Dragon.

Other countries have given us much finer designs for U.P.U. Congress Stamps. One of the most interesting of these, reproduced here, came from Switzerland in 1924, when the U.P.U. celebrated its Jubilee. There were two stamps in the issue, both showing the building in which the first Congress was held in 1874. Another Swiss U.P.U. stamp reproduced on this page marks the 75th anniversary of the formation of the U.P.U., an event that is being celebrated by a world-wide issue, as readers will already have learned from notes in "*Stamp Gossip*."

It is interesting to look back over previous congresses, not only for the stamps that they have occasioned, but also as a help to a realization of the world-wide character of the Union. The Fifth Congress was held at Washington in 1897, and for that occasion sets of United States stamps were overprinted with the words "*Universal Postal Congress.*" These stamps were not issued in the ordinary way. Their number was limited and they were presented to the delegates, so it is practically impossible for collectors to obtain examples. The stamps indeed do not appear in the catalogues.

Other countries issuing stamps in connection with congresses followed the more usual course, and most of their products are readily available at reasonable prices. Sweden marked the Eighth Congress, held in 1924 at Stockholm, by issuing no less than 15 different values in two designs. The 12 low values of this series show the old city of Stockholm, while the three high values reproduce a portrait of King Gustav V. As the U.P.U. celebrated its Jubilee at the same time, Sweden issued 15 more stamps to mark this special occasion. Again the 12 low values had the same design, showing a post boy on horseback, grasping a posthorn and looking surprised by the appearance in the top left corner of the design of an aeroplane, the most modern form of letter carrier. The three high values show a carrier pigeon bearing a letter and flying over the globe, part of which only is included in the design. Incidentally, Germany celebrated the U.P.U. Jubilee by issuing stamps bearing the portrait of Dr. von Stephan.

Other congresses have been held in Egypt the Argentine and France. Cairo was the scene of the Tenth Congress in 1934, when 14 portrait stamps were issued by the Egyptian hosts. In 1939 the Argentine was the scene of the Eleventh Congress, for which a very fine series of stamps were issued. The 5c. value shows the globe encircled by a posthorn. Symbols of postal communications provide material for the design of the 1p. value, and other stamps of the issue show scenes in the Argentine.

The most recent Congress was held in Paris last year, and five excellent stamps celebrated the occasion. One is an air stamp, and all show views in the French capital city. The highest value, the 10 f., is reproduced here.

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**COX, 17, STONELEIGH PARK ROAD, EWELL**


*For other Stamp Advertisements see also pages 400 and xi.*

# Stamp Gossip

## and Notes on New Issues

By F. E. Metcalfe

IT was a relief to collectors and dealers alike when the last "Silver Wedding" set was released at the end of August. Of course, it is appreciated that the Gilbert and Ellice Islands, the colony to issue the last set, are a long way off, and some time had to elapse before their set could be placed on sale, but there was really no logical reason why so many months were taken. There had been slackness somewhere, and the authorities, who on their own admission had issued the "Silver Wedding" stamps to raise extra revenue, had shown very little consideration for those who were providing that revenue. Actually the issue itself for all the colonies had been ill conceived in the first instance, and carried out in a slovenly fashion; and there we can leave the whole business with the hope that our authorities have learned a little common sense after the experience they gained.

In the meanwhile the numerous issues to commemorate the 75th anniversary of the founding of the Universal Postal Union will be out soon after these words are in print, and collectors who are able to spend the necessary pounds will probably find that they have made a good investment in the long run, as did those who bought the "Silver Wedding" stamps. One is not likely to be able to buy the set to-day and sell it to-morrow at a profit, so unless you are prepared to keep your set for a year or two do not buy as a speculation.

The writer of these notes recently flew to Central Europe. The journey was broken at Prague, and a few hours were spent in that fine old city. The stamp shops there received due attention, but very few old "classics" were to be seen; however, the Post Office itself was well worth a visit, for there one can buy at face value many obsolete stamps, and as modern Czech stamps are mostly beautiful productions the writer was able to add some nice items to his collections.

Czech stamps have always been very popular in Great Britain, and collectors who cannot spend too much on their hobby might do worse than take up this country. There is no need to go to Prague for supplies, as our own stamp dealers generally have good stocks, and as a rule these are priced reasonably. So if you want a change try Czechoslovakia.

With so many new stamps coming out, only a collector with an exceedingly deep pocket can afford to buy extra stamps as well as these new issues, which to some extent may account for the decline in sales—we won't call it a slump—in K.G. V issues. Whatever the cause, there has been a drop in the demand, but issues of the present reign are at least as popular as ever, and that popularity covers all countries in the Commonwealth. There was a time when stamps of colonies like Samoa were in very poor demand, but that is all changed now. A dealer mentioned the other day that he had sold over 400 copies of the recently issued 5d. stamp of Western Samoa, and he is not a big dealer either. Our issues are exceedingly popular in America as well as at home, and that helps the demand considerably. It is doubtful if there are half as many K.G. VI collectors over there as there are here, however, yet to hear our American cousins talk everything is cooked up to attack their pockets. They are quite wrong, but we are glad to get their support.

France continues to issue beautiful stamps, but they have undoubtedly overdone it, and there is nothing like the demand for French stamps in Great Britain to-day that there was before the war, in spite of the fact that there are now many more collectors than ever before. Yet their stamps are such handsome productions that it is a pity to neglect them.

Swiss stamps on the other hand maintain their popularity. Technically they are fine productions, but from an artistic point of view they are not to be compared with the French. Most of them do get used postally, which is more than one can say about French stamps; and as a lot of correspondence passes between Switzerland and our own country they can be bought cheaply, which may account for their popularity. Moreover, the postmarks are generally light, and a page of modern Swiss stamps, used, looks quite nice.

Alas, that is more than one can say about a lot of our modern colonial stamps. Gold Coast recently went in for a handsome pictorial set. Why, after one of the postmasters has applied a postmark, is it impossible even to see the design? Nigeria is another colony which utterly ruins its stamps, once they have been cancelled.

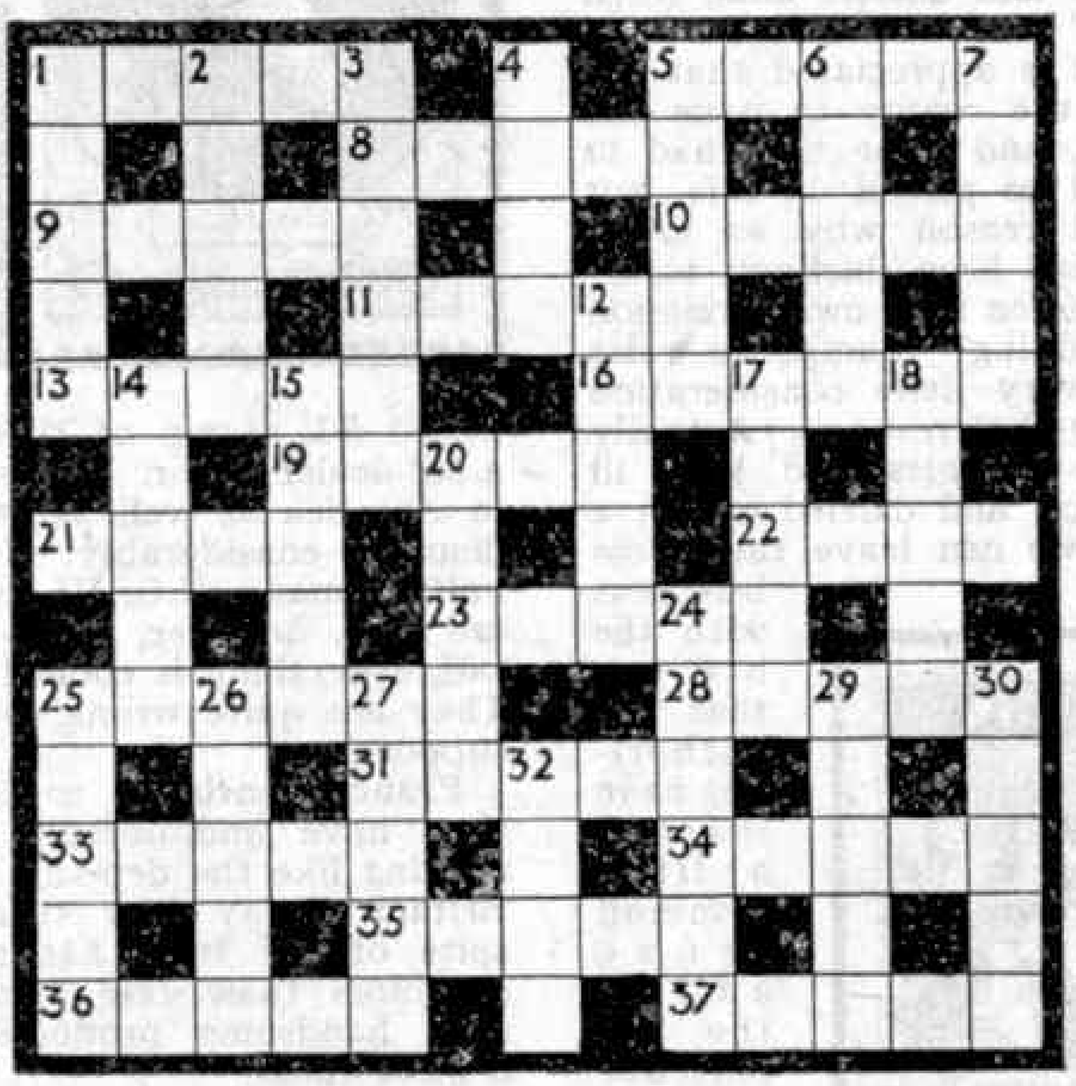
The handsome "Archæological" stamps which India has issued go up to 15 rup. A complete set is beyond the pockets of some collectors, but with a little patience a complete set, used, may be obtained for a few shillings, for huge quantities of used India stamps come to this country.

If you are finding that there are too many general issues of K.G. VI stamps for you to tackle, why not go in for a collection of special issues only? Gradually a fine selection of these are appearing, and the latest of these are the three stamps for Brunei issued on 20th September to commemorate the Silver Jubilee of the Sultan. A really beautiful collection of these special issues can be made and its cost is not excessive, *as yet*. Take that as a tip.

# Competitions! Open To All Readers

*Prize-winning entries in "M.M." competitions become the property of Meccano Ltd. Unsuccessful entries in photographic, drawing and similar contests will be returned if suitable stamped addressed envelopes or wrappers are enclosed with them.*

## October Crossword Puzzle



**Clues Across**

1. Skip
5. Cycle part
8. Flower
9. Lazes
10. Willow
11. Tends
13. Smooth soft mass
16. Sets again
19. Eat away
21. Metal
22. Boast
23. Command
25. Concord
28. Bird's homes
31. Creature
33. Courageous
34. Hard precious stone
35. Prick
36. Bailiff
37. Mistake

**Clues Down**

1. Curl
2. Sticks
3. Slice
4. Asterisk
5. Ordinary writing
6. Force along
7. Pranks
12. Terror
14. Scottish isle
15. Cares for
17. Weapon
18. Characteristic
20. Gas
24. Gain for service
25. Pigment
26. Angry
27. Fat
29. Steps
30. Lance
32. Bird

Our crossword puzzles are great favourites with "*M.M.*" readers. In them there are no traps or alternative solutions. The clues are all direct, and apart from names, every word used can be found in a standard dictionary.

This month we give our readers another of these puzzles, contributed specially by T. K. Chaplin, also a reader. In it there are two sections, for Home and Overseas readers respectively, and we offer prizes of 21/–, 15/– and 10/6 for the best solutions. If there is a tie for any prize the judges will base their decisions on the neatness and novelty of the solutions concerned.

Entries in this contest should be addressed "*October Crossword Puzzle, Meccano Magazine, Binns Road, Liverpool 13.*" The closing date in the Home Section is 30th November; that in the Overseas Section will be 28th February 1950.

## What Locomotives are These?

Competitions dealing with engine names and numbers have always been extremely attractive to "*M.M.*" readers, and here is another that they will enjoy. Below we give twelve short sentences or phrases each of which is a pointer to the name of a British locomotive, and competitors are asked to find the names of the locomotives to which these clues lead. In their entries they are also asked to identify the engines completely by giving the number, wheel arrangement, class and Region of British Railways concerned.

Here are the 12 clues, each indicating the name of a British locomotive:

1. **Saint of Wales**
2. **Designed the "Terriers"**
3. **Famous Lighthouse**
4. **Fast Train**
5. **Head of the Abbey**
6. **He built the line to the West**
7. **Ships cross this**
8. **Heavenly Bodies, here seen together**
9. **A Knocker Up?**
10. **Famous G.W. old-timer**
11. **Suggests locked doors**
12. **Coloured object which twinkles**

As usual the competition will be divided into two sections, for Home and Overseas readers respectively, and in each section prizes of the value of 21/–, 15/– and 10/6 will be awarded for the best efforts. There will also be several consolation prizes, and if there is a tie for any prize the neatness and novelty of the entries will be taken into account.

Entries should be written on one side of the paper only and addressed to "*October Locomotive Names Contest, Meccano Magazine, Binns Road, Liverpool 13.*" Do not forget to give full name, age and address.

The closing date in the Home Section will be 30th November, and that in the Overseas Section 28th February 1950.

## October Photographic Contest

The tenth of our 1949 series of photographic contests is a general one, in which we invite readers to send in prints of any subject. There are only two conditions—1, that the photograph must have been taken by the competitor, and 2, that on the back of each print must be stated exactly what the photograph represents. A fancy title may be added if desired.

The competition will be in two sections, A, for readers aged 16 and over, and B, for those under 16. Each competitor must state in which section his photograph is entered. There will be separate sections for overseas readers.

In each section prizes of 21/–, 15/– and 10/6 will be awarded. Entries should be addressed "*October Photographic Contest, Meccano Magazine, Binns Road, Liverpool 13.*" The closing dates in the competition are: Home Section, 31st October, Overseas Section, 31st January 1950.

# Competition Results

## HOME

### JUNE 1949 CROSSWORD PUZZLE

1st Prize: K. F. Wilkins, Woking. 2nd Prize: D. Pomeroy, Beckenham. 3rd Prize: E. J. Sinton, Aberdeen. Consolation Prizes: D. Howe, Glasgow; F. O'Gara, Harwood; D. A. P. Rice, Newry; R. A. Higgins, Castle Bromwich.

### JUNE 1949 RAILWAY STORY CONTEST

1st Prize: P. Morath, Greasby. 2nd Prize: R. M. Owen, Liverpool 20. 3rd Prize: W. A. C. Smith, Kilmacolm. Consolation Prizes: R. Holmes, Manchester 20; E. Wilson, Dundee; A. Phillips-Smith, Birmingham 27; R. K. Evans, Hessle.

### JUNE 1949 PHOTOGRAPHIC CONTEST

1st Prize, Section A: H. D. Martineau, Woodhall Spa; Section B: H. Wilkinson, Whitefield. 2nd Prize, Section A: T. E. H. Weeks, Carlisle; Section B: A. C. A. Benda, Winchester. 3rd Prize, Section A: I. J. Adgie, Walton-on-Thames; Section B: R. P. Woods, Harrow. Consolation Prizes: L. H. Hobbs, Exeter; M. J. Taylor, Greenford; H. D. Thomas, Aldershot; D. Sibley, Denbigh; P. H. Hill, London S.E.6; M. Williams. Rawcliffe.

### JULY 1949 PHOTOGRAPHIC CONTEST

1st Prize, Section A: E. Whitaker, Liverpool 22; Section B: G. Leaf, Hull. 2nd Prize, Section A: E. Gordon, South Chingford; Section B: T. Hamilton, Manchester 9. 3rd Prize, Section A: W. R. H. Temple, Upminster; Section B: R. Brown, Saltcoats. Consolation Prizes: D. H. Tomkinson, Crewe; G. P. Clark, Tavistock; R. R. Bushell, Hoddesdon; L. Williams, Petersfield; R. Hields, Leeds 8; M. Blench, Shipley.

## OVERSEAS

### JANUARY 1949 PHOTOGRAPHIC CONTEST

1st Prize, Section A: K. R. Cassells, Wellington, N.Z.; Section B: J. P. Palmer, Wellington, N.Z. 2nd Prize, Section A: Miss A. Neilson, S. Canterbury, N.Z.; Section B: P. Jackson, Maritzburg, S. Africa. 3rd Prize, Section A: L. D. Goldblatt, Randfontein, S. Africa; Section B: A. Beadle, Boksburg, S. Africa. Consolation Prizes: R. W. Wilson, Green Point, S. Africa; T. P. Mansergh, Auckland, N.Z. D. F. Sutherland, Dunedin, N.Z.; J. Tertzakian, Cairo, Egypt; L. Wordsworth, Auckland, N.Z.; I. Blaxland, Hutt City, N.Z.; J. Xuereb, Valletta, Malta G.C.

### JANUARY 1949 DRAWING CONTEST

1st Prize, Section A: E. B. Becker, Tunis (F.N.A.); Section B: D. F. Sutherland, Dunedin, N.Z. 2nd Prize, Section A: P. Hughes, Perth, W. Australia; Section B: G. Noble, Pretoria, S. Africa. 3rd Prize: Section A: R. J. Garner, Bukuru, B.W.A.; Section B: G. Jost, Victoria, Australia. Consolation Prizes: K. V. Narayanan, Johore, Malaya; E. Flores, Birchircara, Malta, G.C.; D. A. P. Rice, Naas, Eire; G. Keuck, Bellville, S. Africa; D. Johnston, Clontarf, Eire.

### JANUARY 1949 COVER VOTING CONTEST

1st Prize: T. Searson, Salisbury, S. Rhodesia. 2nd Prize: A. W. Meagger, Cork, Eire. 3rd Prize: T. Bisseker, Kokstad, S. Africa. Consolation Prize: I. Blaxland, Hutt City, N.Z.

### FEBRUARY 1949 ENGINEERING CHOICE CONTEST

1st Prize: B. Carpinter, Christchurch, N.Z. 2nd Prize: H. P. Chinoy, Bombay, India. 3rd Prize: T. Searson, Salisbury, S. Rhodesia. Consolation Prize: P. Partridge, Salisbury, S. Rhodesia.

### FEBRUARY 1949 STATIONS CONTEST

1st Prize: M. T. Hewitt, Ontario, Canada. 2nd Prize: D. Crowley, Durban, S. Africa. 3rd Prize: K. C. Bell, Wellington, N.Z. Consolation Prize: M. J. Myers, Cape Town, S. Africa.

### FEBRUARY 1949 PHOTOGRAPHIC CONTEST

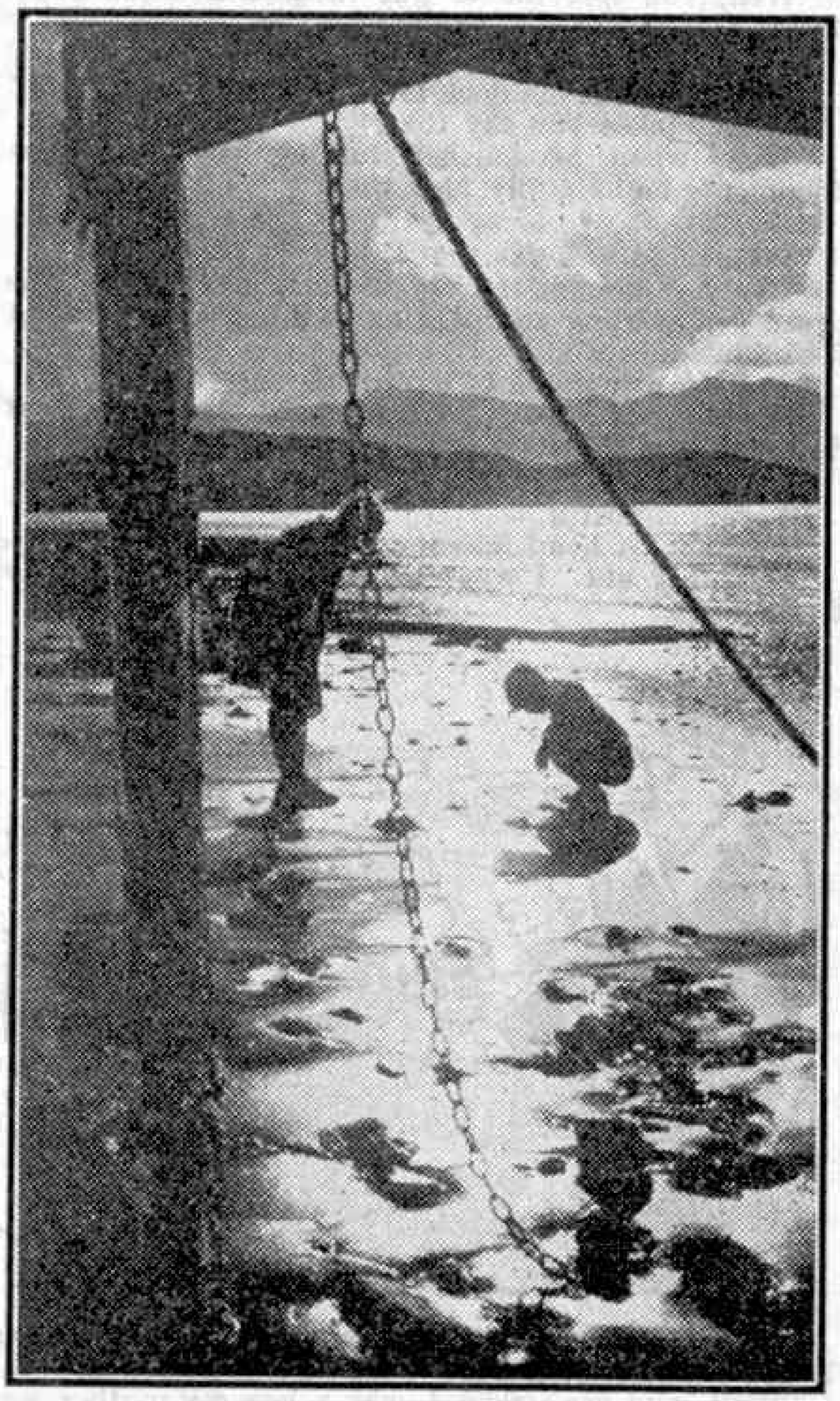
1st Prize, Section A: E. O. L. Woodward, Bombay, India; Section B: A. Mold, Johannesburg, S. Africa. 2nd Prize, Section A: W. Thomson, Cape Town, S. Africa; Section B: S. H. Williams, Cairo, Egypt. 3rd Prize, Section A: J. Bellis, Dublin, Eire; Section B: G. Ball, Auckland, N.Z. Consolation Prize: S. Wallace, Dunedin, N.Z.

### MARCH 1949 DOUBLETS CONTEST

1st Prize: G. Thake, Birkirkara, Malta G.C. 2nd Prize: M. K. Daly, Auckland, N.Z. 3rd Prize: R. Vickers, Auckland, N.Z. Consolation Prize: P. Askew, Nelson, N.Z.

### MARCH 1949 RAILWAY QUIZ CONTEST

1st Prize: W. A. Johnston, Pretoria, S. Africa. 2nd Prize: T. W. Robinson, Wellington, N.Z. 3rd Prize: J. H. Bates, Toronto, Canada. Consolation Prize: K. Aston, Washington, U.S.A.



**A very unusual beach photograph taken in the late afternoon sunlight by P. H. Brett, New Zealand. Awarded 1st Prize in the Section A, March 1949 Photographic Contest.**

# Fireside Fun

"Why isn't your usual centre forward playing to-day?"

"He's got measles."

"Then he should have been here. Our centre half would have knocked the spots off him."

* * * *

"Good gracious Billy! How dare you eat those new cakes?"

"Well, you told me to put them where the baby couldn't get them."

* * * *

"That fellow in the dock must be a good mechanic."

"What makes you say that?"

"Well, when he finished forging all those false documents he carefully filed them."

* * * *

"Where did you get that dog?"

"I've just bought it from the man next door. The brute was howling and barking so much all night that I couldn't sleep."

"And are you going to have it destroyed?"

"No fear. If I keep it in my yard the fellow next door will lose his sleep now, won't he?"

* * * *

"I want a mirror."

"Yes, sir. A hand mirror, I suppose."

"Certainly not. I want to shave, not to polish my finger nails."

* * * *

"Dear me, Jones! Couldn't you find a better job than looking after a car park?"

"Well, you see, when I was a boy my mother was always telling me to mind the cars."

* * * *

**THIS MONTH'S HOWLER**

Gorgon is a kind of cheese of horrible aspect.

**BRAIN TEASERS**

**MAKE YOUR OWN MAGIC SQUARE**

A word square without clues will give a chance to readers to show their initiative and enterprise. One of the words is given, with seven other letters, as shown in the square below. Can you complete this, remembering that the six words across must be the same as the six words down?

| | | | | | |
|---|---|---|---|---|---|
| C | I | R | C | L | E |
| I | | | | E | |
| R | | | E | | |
| C | | E | | | E |
| L | E | | | E | |
| E | | | E | | |

S.W.C.

"Lady, if you give us a penny my little brother will imitate a hen."

"What will he do?" asked the lady. "Cackle?"

"No, anybody could do that. He will eat a worm!"

* * * *

**A FINE FINISH**

Tom and Dick ran a mile race on a track with a length of 220 yards. When Tom had covered six laps Dick had only covered five, but Dick then doubled his pace. Who won?

B.I.N.

* * * *

**IT CAN BE DONE!**

It is proverbial that a square peg cannot be fitted in a round hole. Can you do the opposite, that is fit a round peg exactly into a square hole, each side of which measures say $\frac{1}{2}$ in?

* * * *

**IN AND OUT**

At its first stopping place a quarter of the passengers in a bus got out and 10 entered. At the next stop half the passengers left and 20 more passengers came in, making the total then 37. How many were there in the bus to begin with?

* * * *

**SOLUTIONS TO LAST MONTH'S PUZZLES**

The six motors of our first puzzle were: RILEY, STANDARD, CHRYSLER, HEALEY and ALLARD.

Of the 1,728 small cubes in our second puzzle there were none painted on four sides! The number painted on one side was 600, the number painted on two sides 120, and the number painted on three sides was 8. This leaves 1,000 not painted at all.

The four words to which the clues in our third puzzle lead are DRAFT, MALADY, COMET, and DISPLAY.

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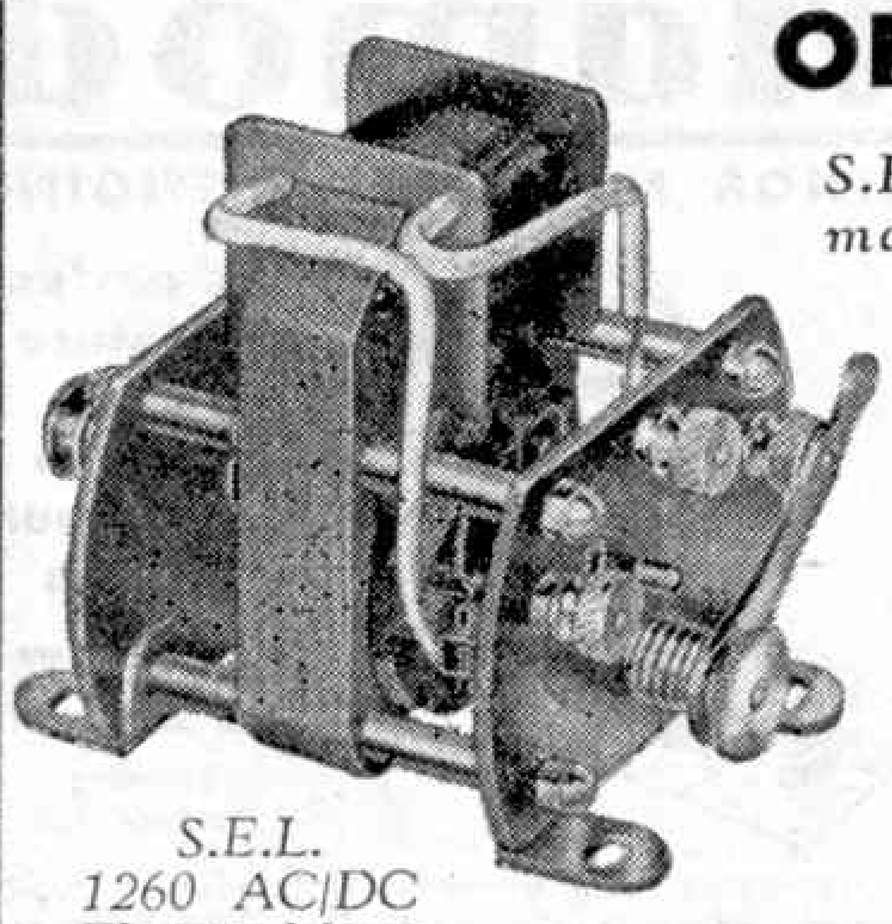

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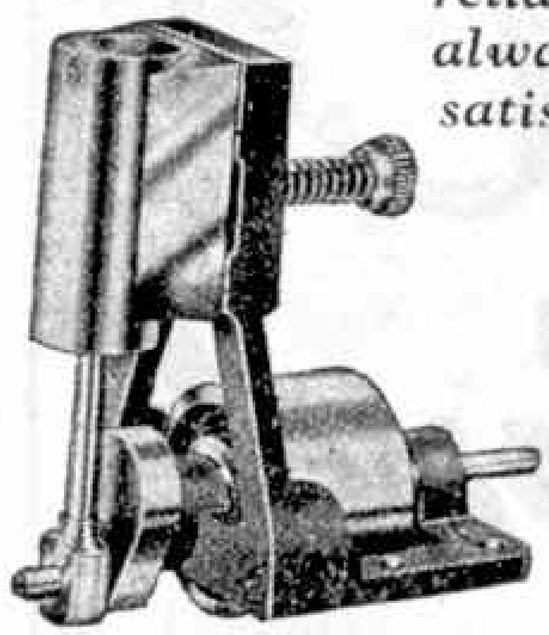

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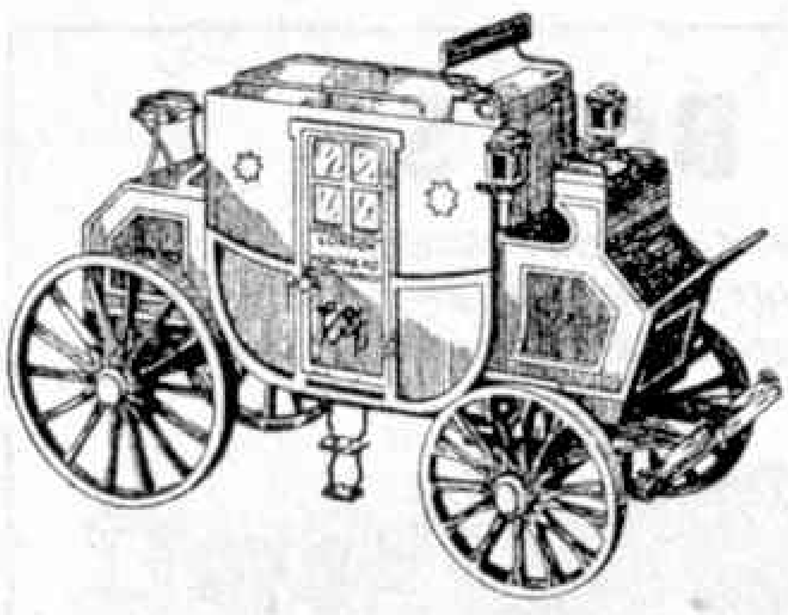
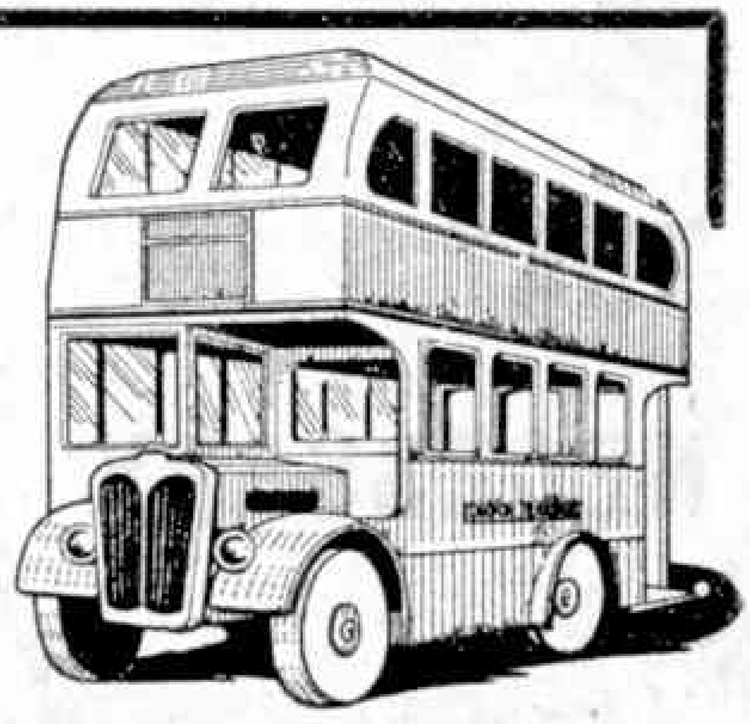


# The Old Stage Coach or The Modern Bus



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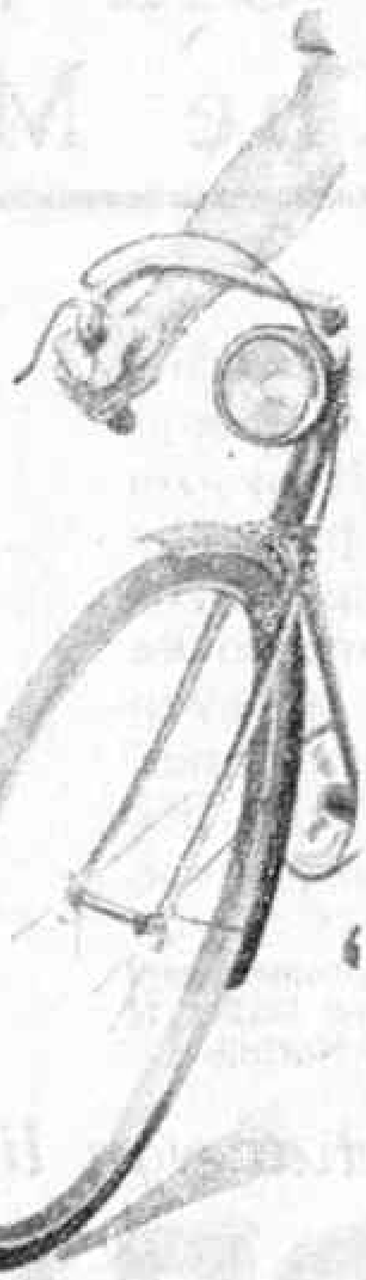

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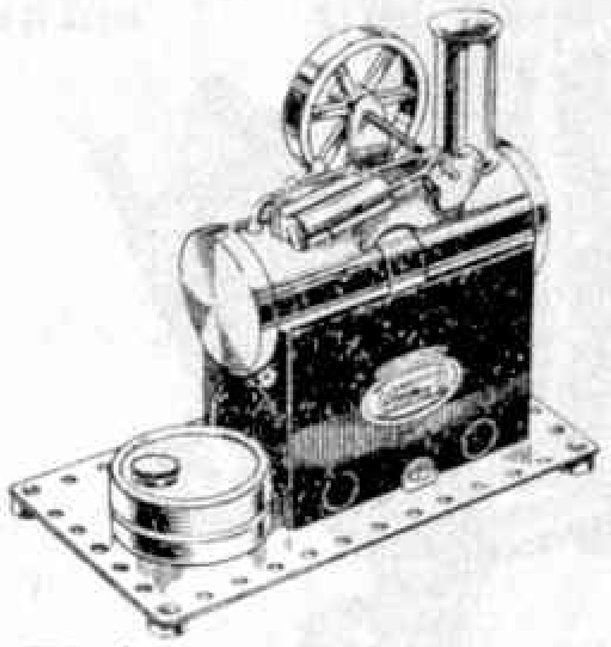

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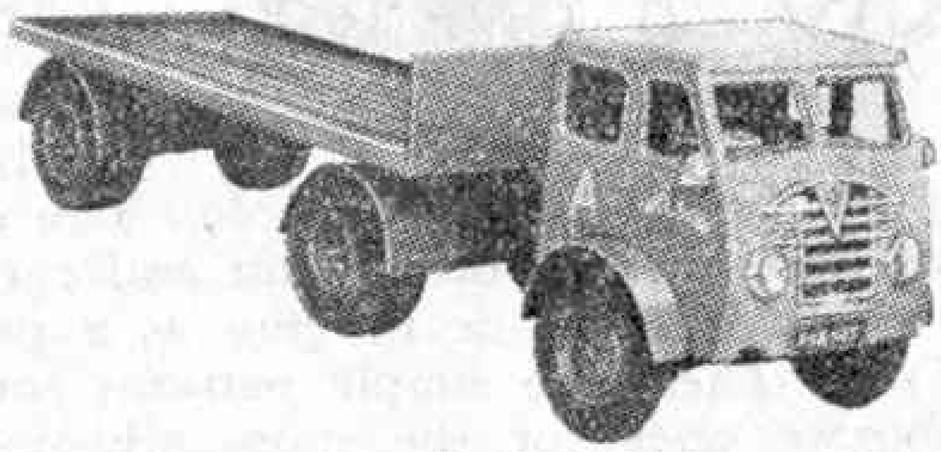

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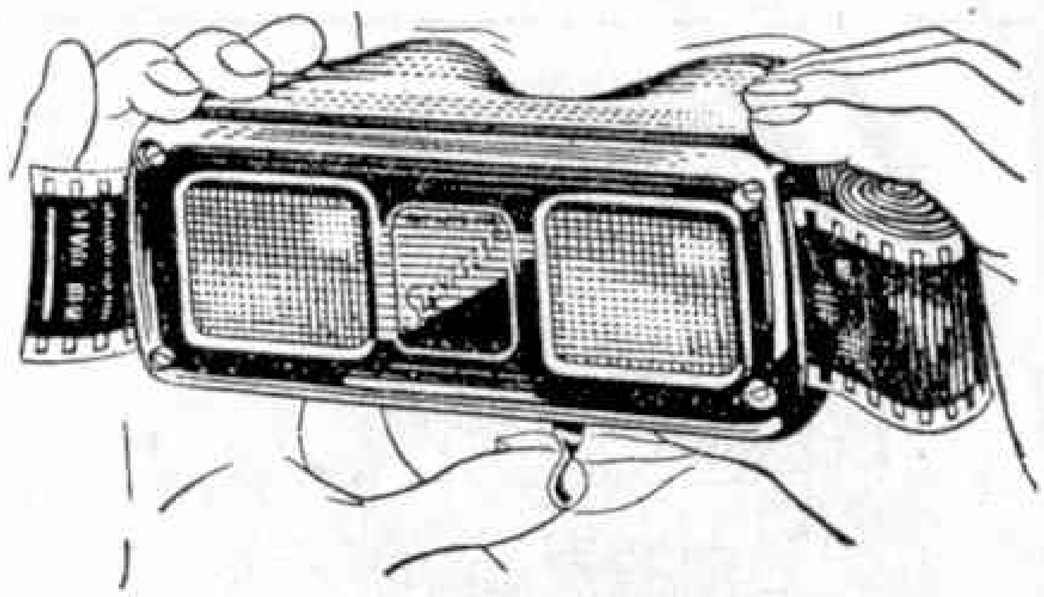

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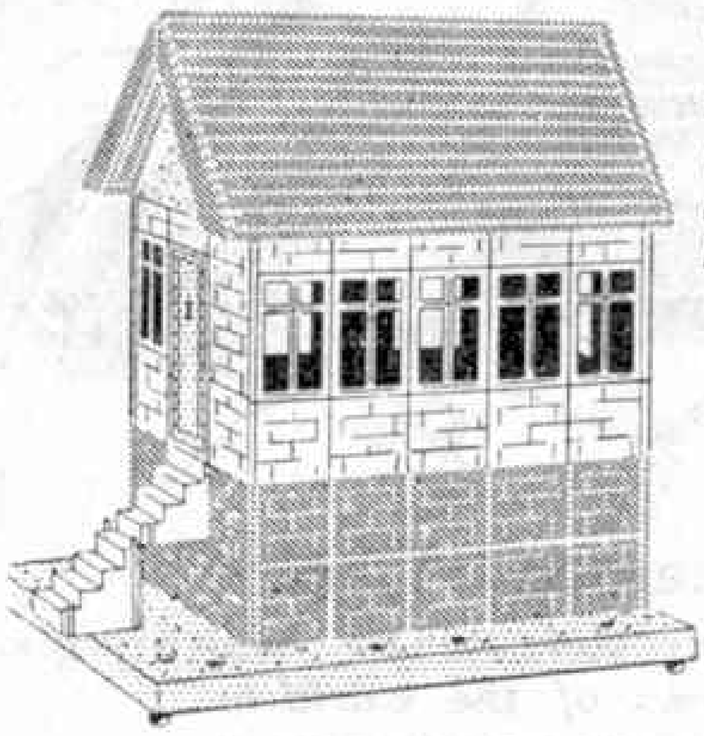

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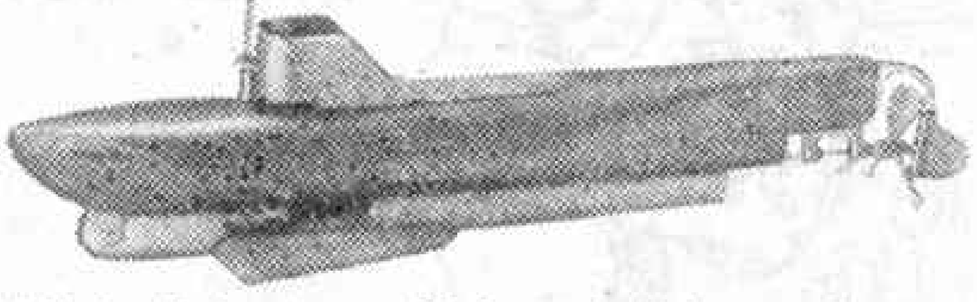

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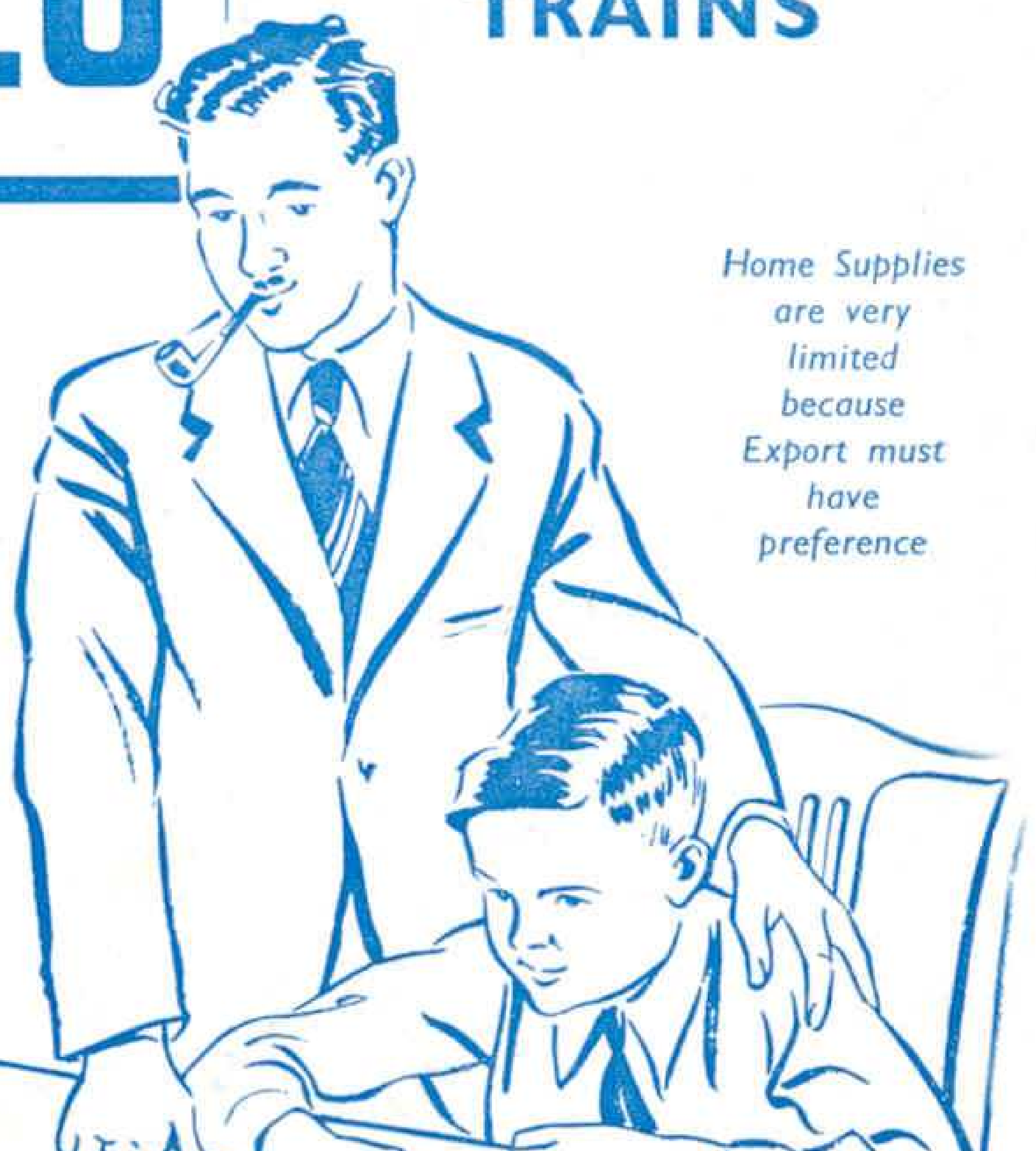

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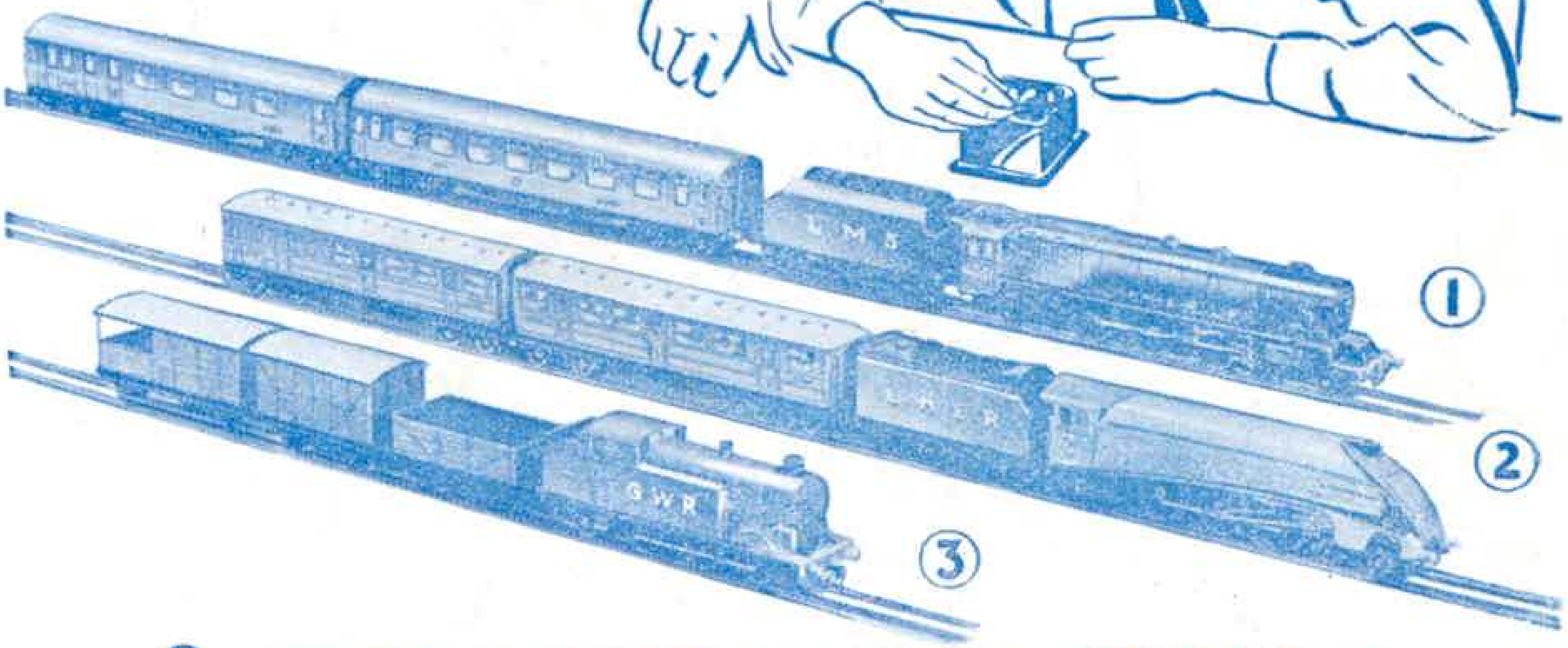


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